



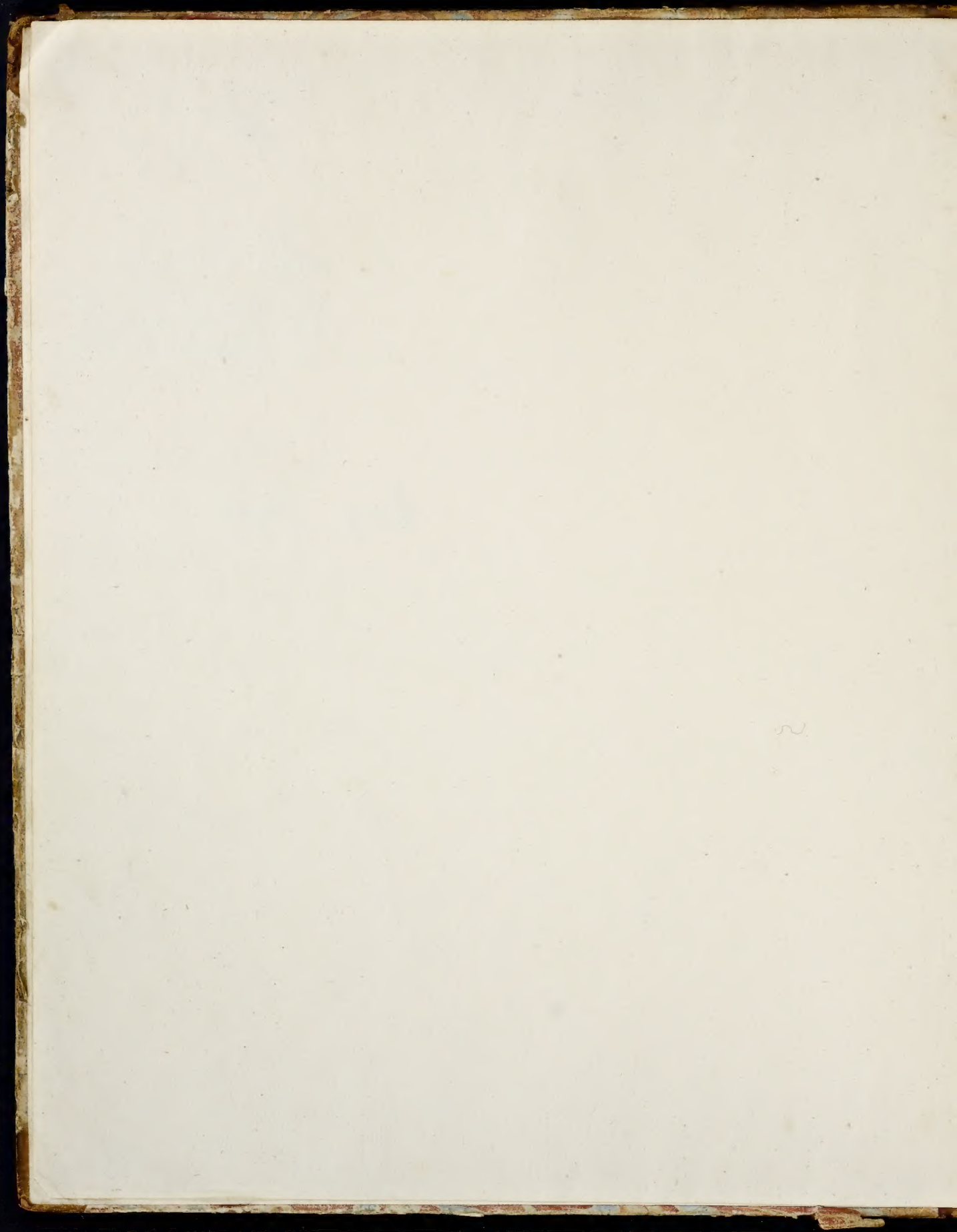


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Large Paper





THE HISTORY OF THE

PROVINCE OF NEW HAMPSHIRE

FROM THE FIRST SETTLEMENT

TO THE PRESENT TIME

IN TWO VOLUMES

BY

JOHN RAY, ESQ.

OF THE BARR

AT NEW HAMPSHIRE

AND

OF THE BARR

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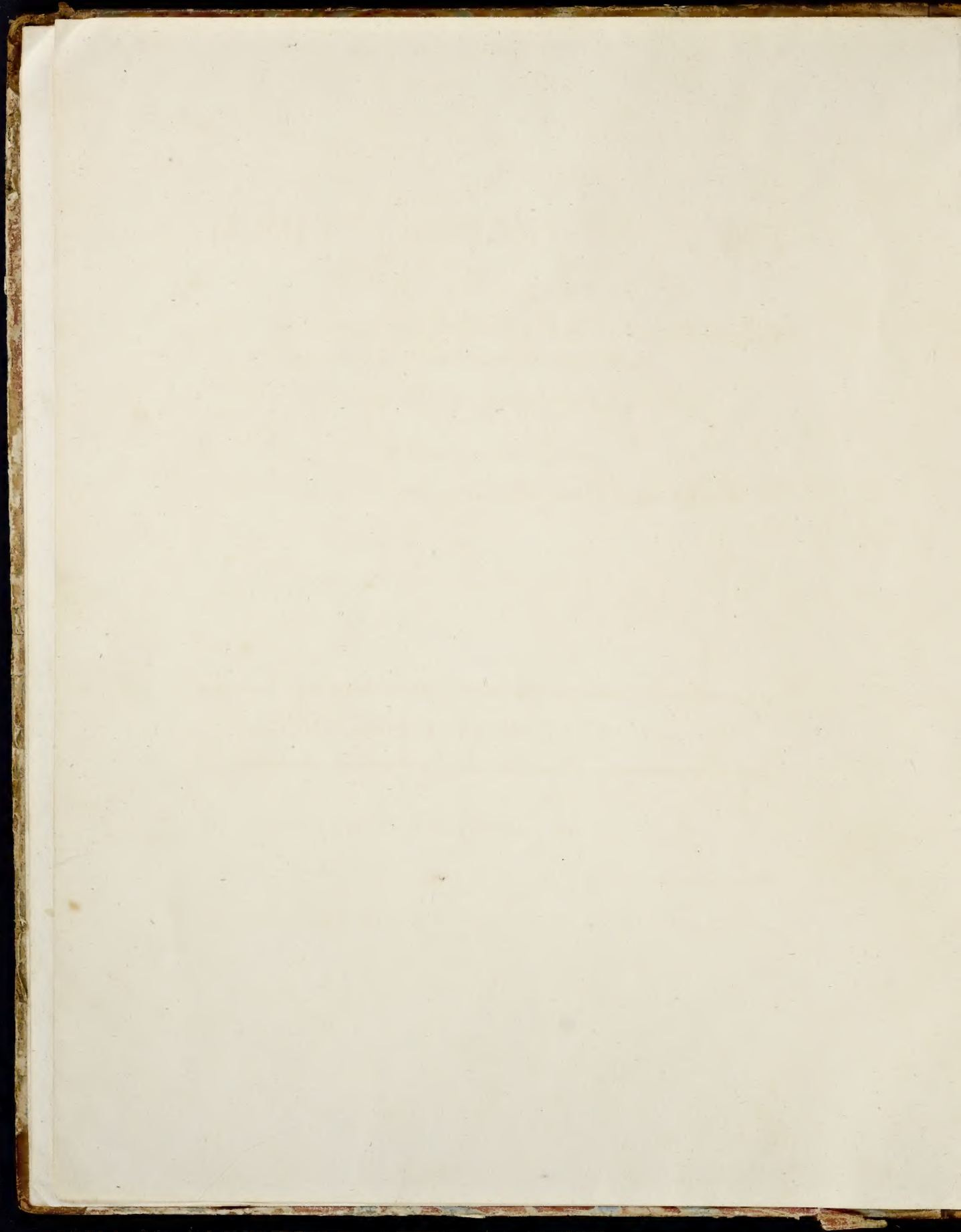
OF THE BARR

AT NEW HAMPSHIRE

AND

OF THE BARR







# FAMILIAR ARCHITECTURE;

CONSISTING OF

Original Designs of Houses for Gentlemen and Tradesmen,  
Parsonages and Summer-Retreats;

With Back-Fronts, Sections, &c.

TOGETHER WITH

Banqueting-Rooms, Churches, and Chimney-Pieces.

TO WHICH IS ADDED,

The Masonry of the Semicircular and Elliptical Arches,  
with practical Remarks.

---

By THOMAS RAWLINS, Architect.

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Printed for the AUTHOR, M, DCC, LXVIII.

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N. B. No Copy of this Work is authentic that has not my Name in my own Hand-Writing affixed  
to it in the Title Page.

*Rawlins*  
P



# THE UNIVERSITY OF CHICAGO

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T O T H E  
P U B L I C.

**A**RCHITECTURE is a Science so well known, so judiciously treated by various Authors, and so clearly exemplify'd by well conducted Plans and Designs, as to render any Repetition here needless, as well as foreign to the Purpose.

THE many excellent Geniuses, who have largely expatiated on this Subject, have form'd Plans too extensive for the plain Villa, the Parochial Church, and elegant Mansion: Their lofty Views, and unlimited strength of Imagination, have so far hurried them away, that they have neglected to render their Designs useful and instructive to Country Builders.

ONE of our ablest modern Writers on the Art of Structure (speaking of Designs in general) says, that he means not small Houses, tho' at the same time he confesses they often require the Skill and Direction of an Architect.

THE many Objections made by Gentlemen, and Artists, to the Plans and Designs already published, are obvious: For, waving their Magnitude and Expence; the Offices being under Ground, no way answer the Uses required in the Country; where, in general, there may be found sufficient Space above: Though in Town, indeed, Restriction and Expence of Ground-Rent are often productive of many Inconveniencies.

A

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It must give the highest Satisfaction to a speculative Genius, to consider the utmost Extent of Architecture, and to weigh the different Effects it impresses on the Mind, according to the different Structures presented to the View! How awe-struck must be the Passions, when we behold the antient Buildings of *Greece* and *Rome*! How sooth'd and mollify'd, when we descend to the pleasing rural Cot, where simple Elegance, Proportion, and Convenience unite! The Soul may then be said to be tun'd and exhilarated by the Objects which strike the Attention.

CONSCIOUS as I am of the difficulty of my Task, so am I aware that some may be inclined to question, whether a Man engaged in any particular Branch of Business, can have leisure enough to cultivate so copious a Study as that of Architecture in general: Such I must refer to the Work itself-----From thence let them draw their Answer.

THUS far however, I presume to plead in its Behalf: Every Man has some favourite Aim in view, be it Study, Business, or Pleasure. That which the Mind is most earnestly bent upon, we most closely pursue: That which is most closely pursued, will doubtless be brought nearest to Perfection: The Study which Nature directs us to, has unquestionably the strongest Prevalence on the Mind: For while we labour, we may be said to sport; and Toils are converted into Delight.

WHAT I would infer from hence is, that this Science having been from Infancy my constant Amusement, the Entertainment of my leisure Hours, and being closely connected with my Occupation\*, it may not be deem'd extraordinary, if I should have made some small Progress in it.

IN the Course of this Work, there is as little regard paid to Town-Buildings, as former Authors have bestow'd on those in the Country.

UNMIX'D Elegance, and explanative Usefulness in the Offices, I apprehend to be one of the most essential Parts of Design: Which, together with the *Grecian* and *Roman* Purity, join'd to the harmonious *Dictates of Nature and Science*, are strictly adher'd to; therefore I have preferr'd them to

\* A Stone Mason.



Gaiety and Ornament. If they are any where touch'd upon, 'tis merely to shew where such Embellishments may be justly appropriated and display'd.

A PERSON inclinable to build, if he duly survey his intended Spot of Ground, and strictly consider the Offices he may have occasion for, will find a great difference between a pleasing, undecorated, convenient Pile, and a wild Mass of superfluous Lumber, that must unavoidably offend the Eye of every judicious Beholder: For Proportion, Convenience, and Nobleness, may be seen in the most native Simplicity.

THE lofty and extensive Ideas of our great Authors, being solely confin'd to Stateliness and Splendor, rise to so superb a Strain, that they can be of little Assistance to the Studies of the young Architect. For before he can be made acquainted with the necessary Conveniencies of a Building for a small Family, he is hurried imperceptibly away with extatic Views of becoming great at once.

FROM such Imaginations, I must, for my own Part, beg leave to dissent: My Plan being to form something that may be of great Utility to the Public in general, which I prefer to all other Views.

IN Towns and Villas, Architects are rare to be met with: Therefore this Work is so calculated, that the meanest Capacities may comprehend it: The great Variety of Plans here explain'd, are to point out the many different Conveniencies that may be made in a House from Thirty to Sixty Feet in Front, and upwards: This I thought would improve their Ideas, and make them capable of conducting small Buildings with Freedom, Simplicity, and Elegance.

THE superb they must not expect; as the Proprietor will certainly consult Men of the greatest Abilities.

A LATE ingenious Architect in his Treatise, says, "That he has not set down the various Uses and Distributions of the Apartments in any Structure"-----'Tis to be wish'd he had-----For if the young Students are to make Convenience their Study, without some fix'd Basis, from whence are

their

their Ideas to spring? That a foundation in Knowledge must be laid in the lesser Works, e'er he can hope to reach Perfection in the greater, will, I think, admit of no Dispute.

I IMAGINE, pointing out the nearest Way of forming Plans agreeable to the Ground allotted, with as much Conveniency as the nature of the Place will admit of, must give to real Geniuses a fair Opportunity of improving and bringing Design to the greatest Perfection.

As I have before mentioned the Inconvenience of Offices under Ground, I may be allow'd to descant somewhat farther on them. The Heats and Steams arising from Kitchens so situated, are not only disagreeable, but unhealthy:-----Yet when the Offices are properly disposed in Wings, or, at the most distant Parts of a House, as here delineated, every Nuisance will be carry'd off, every unpleasing Stench avoided, and the whole render'd commodious as well as wholesome.

SINCE I am speaking of the Wings, I must take notice, that every particular Convenience is not consider'd: For it often happens, that Persons possess'd of equal Property, as their Spirits or Tempers vary, may not require the same Accommodations: These therefore may be either contracted or enlarged at pleasure.

FREQUENT Observations have been made, that where there are large Halls, with cross Passages, in small Buildings, the Rooms in general are no better than Lobbies; which Inconvenience is here carefully avoided, as far as the Plans inserted will admit of.

A PROPER Entrance, with free Communications to each Apartment, without going through another, forms the whole commodious.

ARITHMETICAL Proportions being particularly regarded, the internal Parts may be made to suit the Temper, Genius, and Convenience of the Inhabitant, by enlarging, or reducing the Scale. And I flatter myself, (by the Diversity of Examples) that it will enable Gentlemen to interchange any of the Wings which may most please them, with whatever House best suits their Conveniency: Or, to alter an old bad Plan to a more commodious one,

and



## TO THE PUBLIC.

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and at the same Time to give the necessary Directions themselves; the whole being familiariz'd and explain'd in the easiest Terms, for that Purpose.

THERE are some few Things more in this Undertaking necessary to be observ'd. The Lengths and Widths of the Fronts, as express'd in the References, are only the Clear of each Room. As all Persons that build are not willing to go to an equal Expence, some liking thick, others thin Walls, and some only Stud-work: Yet, which ever they make use of, the Dimensions will very nearly carry the same Proportion. I have figur'd down the Dimensions in each Room, and mark'd the Kitchen with a K: so that by examining the Plan, every Apartment is presented at once to the View; which will facilitate and strengthen the Conception.

I HAVE not set down the Dimensions of each Door or Window, referring them to the Scale; nor have I introduc'd any order for the Cornices: But wou'd recommend to the Student the avoiding superb Cornices and Door Cases to plain Buildings.

NOR have I given any Estimation to the several Designs, as have been practis'd by some Authors; such as that by the great Square, the Prices of Materials and Work, &c. Those Methods appear to me, not to have been so well consider'd as they ought to be; but to have been the Cause of many Conteſts between the Owners and Builders, to the Prejudice of many industrious Men of Integrity in the County. I would only ask, how a Man can pretend to establish certain and invariable Rules (if his Work is design'd for general Use to the Public) when the Prices of Materials, Carriage, Wages, and other Charges, vary so very considerably in different Parts of the Nation, as well as the different Methods of Building? I would therefore advise the young Architect or Builder, as soon as his Plans and Designs are fix'd on, to inform himself of the Prices of all the Materials, (and other Expences attending it) that are to be had nearest to the Spot of the intended Edifice. This is the only way of Estimation: Such Rule as this closely pursued, will be most lasting and satisfactory to the Proprietor, and is the only Method to establish the Character of every judicious and honest Workman.

MANY Gentlemen, &c. have made Objections to broken Pediments, that is, where the horizontal Cornice under them is continued only three, four,

or more Feet on the Front at each End. Now if that be a fault, the Blame is not to be laid on the Designers in the present Age, as their Invention; because we have these Examples laid down to us by that great Master *Andrea Palladio*, and others: And if we were to confine ourselves only to whole Pediments, there would be no Variety.-----Notwithstanding this, I would not recommend them in large Buildings where there are Columns, or Pilasters, nor where whole Entablatures are introduced. But in little Buildings with small Cornices only, or a Cyma and Facia, in my Opinion, they have a light pleasing look, especially if a little Ornament is introduced in them. Therefore, the greatest Part of the Elevations where I have design'd them, may be made either way. In two late Publications, Disputes have arisen about the Qualifications requisite for an Architect: I cannot entirely acquiesce in the Opinion of either Author.

THE one alledges, That you must be well acquainted with the Prices of all the Sorts of Materials and Work, that you may not be liable to the Impositions of mercenary Workmen:-----And I hope too, for better Reasons than so illiberal and indiscriminate a Suspicion.

ONE Qualification for an Architect, I presume is, to be thoroughly acquainted in the practical Part of Building, which must be gained by a close Application and much Experience in the different Branches. Thus he will be the more able to form a Judgment, when he draws a Design, whether it can be apply'd to Practice; and whether all the Parts, when fix'd on their proper Basis, stand in a State of Equilibrium. If this had been the first Principle of their Study, we should not see the many Blunders in the executive Part so often committed.

As for adjusting the Prices, how can a Theorist, who gets his Knowledge only in a Study, judge the Value of Work? when at the same Time, if he knew how many Feet, Yards, or Squares, one or more Workmen can perform in a Day or Week, &c. he might then have a thorough Knowledge of Charges; be able to find out those who are more mercenary than honest, and to distinguish and recommend Workmen of strict Integrity; who, I believe, are many.

THE



THE other Author wou'd insinuate, That a proficiency in Architecture can hardly be attain'd without Travelling. With respect to this, my Opinion is, That the Seeds of Genius are sown in the Mind at our first Formation in the Womb, which may be term'd innate Ideas; or such as Nature has implanted in us. And if this natural Genius be cherished, improved, and refin'd by proper Methods of Study and a close Application, it gradually grows to Maturity.

WHEN a Man is so happy as to be born with such a Talent, the difference I believe would be very small, whether he travell'd, or closely examin'd the Copies of the remains of those antient Monuments, taken by the many ingenious Gentlemen who have given us their Measures; which are of use to us in Study, for the Refinement of our Taste in the Ornamental Part.

I SHALL not pretend to so many Sciences as some do, but only to that of Architecture: For, as Mr. Pope observes in his Essay on Criticism,

*One Science only, will one Genius fit,  
So vast is Art, so narrow human Wit.*

HOW far I have succeeded in this my first Attempt to form a Work of real Use to the Public, I shall leave to the Determination of all candid, ingenious and impartial Judges.

SOME few Errors in the Drawings and Engravings may have escaped my Notice; but I hope they are pardonable: And shall conclude this Subject with saying, that as long as we carry Nature, Utility, and Harmony in our Ideas, ARCHITECTURE will be the Admiration of all Ages.

\* \* \* WHAT is here presented to the Public, I undertook to calculate for the laying a Foundation for a Work of general Use, and especially in the remote Parts of the Country, where little or no Assistance for Designs is to be procured; as also for the Instruction of Youth after their Study of the Five Orders: (which I have not introduced in this Work, there being sufficient Instructions about them already published.) And their close Application to this Treatise, I flatter myself, may be the means of improving their Ideas, and rendering their Works useful.

I MUST beg leave to caution the young Architect, not to let his Fancy flow into Luxuriancy by a Multiplicity of Members, Ornaments, and Drefs.-----As Elegance does not consist in an exceeding Superfluity, but in natural Proportions, Freedom, and Harmony mingled with Neatness and Simplicity: These are the Foundations on which he must build his Hopes for Success. And as I before observ'd, let him study and make himself well acquainted with the necessary Conveniences for the Completion of small Buildings, before he aspires to Schemes of Palaces, which he may never probably have occasion to apply to Practice.

The AUTHOR.



Practical



# Practical R E M A R K S on A R C H E S, &c.

**T**HE many ingenious Authors on the Subject of Arches have hitherto confin'd themselves to the Theory; and by their exact and judicious Calculations, have endeavour'd to prove the Strength of each of their favourite Curves.

As none, that I know of, has wrote on the Practical Part, and particularly in a late Dispute concerning the Strength of the Semicircular and Elliptical Arches: I have taken this Opportunity (without intending to engage in any intricate Disputes) to communicate my Sentiments, form'd from natural Ideas, cultivated in the Studies of my Occupation. Therefore my Design is to explain the Practical Part, and to convey such Hints as will render it useful to those who make Architecture their Study; but more particularly for the Improvement of the young Student; to whom I shall propose the two following Questions.

## What is an A R C H in Geometry?

**I**T is any Part of the Circumference of a Circle or curv'd Line, extending from one Point to another.

## What is an A R C H in Mafonry?

**I**T contains a number of Stones, hewn out and wrought, which when set in their proper Places, are as one solid circular Course, whose lower Ends form any Part of a Circle or curv'd Line, calculated to support any Weight, proportionate to their Strength and Figure.

\* "ALL solid Materials, free from Impediments, descend perpendicularly; " because Ponderosity is a natural Inclination to the Center of the Earth, and Nature per-  
"formeth her Motions by the shortest Lines."

**T**HIS proves, that all Arch-Stones must be drawn from their central Points to form the Curve; otherwise their Bearings will be rendered imperfect.

**T**HE first Arch I shall describe is the Semicircular, without the additional Mafonry:  
*Fig. 1.* Draw a Chord (or straight Line) from *g* to *g*, in the Middle of which fix your Center *C*. The Diameter from *A* to *B* I propose to be 50 Feet. After having circumscrib'd

\* From Sir Henry Wotton's Theorems.

# 10      PRACTICAL REMARKS ON ARCHES, &c.

your Line from *A* to *D*, and to *B*, divide it into 33 Parts; then extend another Circle *e e e*. allowing three Feet for the Thickness of the Arch *C* to *m*. From each of your 33 Divisions, with your Rule, draw a Line from *C* through the Point *d* to *e*: which when done, forms 33 Voussoirs or Arch-Stones.

HAVING drawn your Arch, the next thing is to prepare a Mould for working each of the said Stones. What is meant by a Mould, is, a piece of Deal or other Board about half an Inch thick, cut very exact to fit the Front-Face of the Drawing for each Arch-Stone; so that all the Stones when wrought must fit that Mould either Side uppermost. By this Means, any Stone may be set on either Side or Top of the Arch.

ANY Segment of a Circle is wrought in the same manner as the Semicircle, if the Lines be drawn from the same Center: And the Bed of the Springing-Stone, which the Arch stands upon, must be drawn from the same central Point.

THE Elliptical Arch I have drawn as generally describ'd by Workmen, viz. on three Centers, as 1 2 3. The Width on the Chord or straight Line, and the Thickness of the Arch, the same as the Semicircle, and consists of 29 Arch-Stones, each being nearly of the same Dimensions at the Bottom as the Semicircular, *ffff*. *Fig. II.* Draw a Chord or straight Line of the same Length as the Diameter of the Semicircular; being 50 Feet in the Opening: divide the Distance from *a* to *e* into four equal Parts, as *a* 1, 1 *d*, *d* 2, 2 *e*: From the Center 1 describe the circular Arch *a b*: also *e g* from the Center 2: then from the Center 3, describe the circular Arch *b c d*. From these different Centers the outside Curves are drawn *b b b*, limiting the Thickness of the Arch *l* to *m*, which is 3 Feet; which Stones being describ'd from different Centers, they require different Moulds to form them. Those taken from the Center 3 are the number from *k l* to *k*: the others taken from 1 and 2, form each their Stones from *a* to *b*, and also from *e* to *g*.

N. B. I have not drawn the Arches thicker at Bottom than Top, as has been proposed by some; which may be a very good way of doing them, if each Arch-Stone be wrought out of one Piece: but as such a number of large Blocks are not always to be had from a Quarry without some Difficulty; the manner I have here laid down in *Sett. 1*, is equally as strong, for Arches can never give way at the Foot (if the Piers will stand) but will descend perpendicularly from the Crown of the Arch or thereabouts.

THE Inside Figure of an Arch does not alone determine its Strength; it is, the different Thickness of the Stones and Joints taken from one or more Centers, that does it.

Now, as I have already observ'd, the Proportions of the Semicircular (*Fig. I.*) are every where equal, are all wrought by one Mould, taken from one Center, and form all their Joints alike; which when set in their Places, must receive an equal Pressure on each of them, and will appear the most graceful, natural, and easy. And, respecting its Offices in bearing, it appears to me not to have a perpendicular Pressure on the Piers: and I think, it cannot have a lateral Pressure; as it sustains itself from the Top to the Bottom in a State of Equilibrium. And wherever an Arch is taken from more than one Center, it cannot be in Equilibrium; and the Reason of this you may form a Judgment of by the following Elliptical Arch.

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THE Elliptical Arch, as in *Fig. II.* being taken from more than one Center, requires two different Moulds to form the Stones by: The shortness of the one Radius, from 1 and 2, and the extraordinary length of the other from 3, occasion such considerable Difference in the Form of the Arch-Stones, that the upper ones are nearly to a Parallel in the Joints; and those from the Centers 1 and 2, are about  $\frac{1}{2}$  wider at their Top than they are at the Bottom: The Difference being so great in their Beds, (as you will observe in the Drawings) must cause a very unequal pressure: For if their Joints or Beds are unequal, the pressure consequently will be so too, and the Stones that should be the strongest are at bottom instead of the top: That the nearer they come to a parallel in the Joints or Beds (as mention'd above) on the upper Part of an Arch, the weaker it is; and the wider they are on top, the stronger; will, I think, admit of no dispute. For if an Arch of this kind give way, the Stones that are nearest to the top are in the greatest danger of falling, as it will naturally spring at K, being furthest from the Line of the lateral Pressure. I am treating only of the Arch itself: For Art may be made use of, to secure it in the Joints, as well as the Spandrels and Haunches.

As many Disputes have arisen, relating to the Strength of Arches; I take the liberty to offer my Opinion on that Subject; which is, That, that Arch (of whatever Curve) where all the Stones are wrought by one Mould, and their upper Ends in a wider Proportion to the lower than any other, is the strongest Arch that can be, (supposing it 50 Feet opening, and the Ends no more or less than as figured in the Plate.) For, if by Torrents, the flux and reflux of Tides, or some other Cause, the Foundation should give way, (as I presume that Bridges are not always erected on Rock or Chalk Bottoms) so that you find the Piers sinking, and in consequence the Strength of the Masonry in the Piers and Spandrels broken, and the Arch-Stones in danger of dropping through; then, which Key or Arch-Stone will stand longest? that which is 2 F. 4  $\frac{1}{2}$  In. at Bottom, and 2 F. 8 In. at the Top; or that which is 2 F. 3  $\frac{1}{2}$  In. at Bottom, and 2 F. 6  $\frac{1}{2}$  In. at Top? I believe this requires very little Consideration to determine. In respect to their Beauties in design, I would only ask, which is most pleasing to the Eye; a straight well-proportion'd Man, with a strong plain Coat on, or a Man with hunch'd Shoulders bedeck'd with gaudy Trappings.

HAVING perused the Opinions of some of the Mathematicians, I shall here make some Remarks on what the ingenious Mr. *Emmerson* has said upon Arches, in his Work entitled, *The Principles of Mechanics. Fig. 307*, "*D. B. F.* is the Arch of a Bridge, which shall sustain itself, and all the Parts of it in equilibrio. Such an Arch will be stronger than any other, because an Arch that can sustain itself, will more easily sustain an additional Weight, than an Arch that cannot sustain itself, but only by the cohesion of the Mortar. This Arch, *D. B. F.* is a Semicircle." Thus far he supports me in my Opinion of the Semicircle. But in the 10th Line he says, "But as this Form is not commodious for a Bridge"—I presume he thinks it will rise too high on the Top; especially, if the Banks should be lower than ordinary, so that it may occasion the Ascent to be tiresome.

As much has been said of the Catenary, I shall here borrow his Sentiments at large on the Strength of such an Arch. *Fig. 311*. "If any Architects or Builders of Churches or Bridges, shall please to make use of this Curve here constructed (*Fig. 311*) for the Form of an Arch, they will find it the strongest Arch possible to be made, for these given Dimensions. And where many thousand Pounds are laid out in building a single Bridge, it is certainly worth the pains, to seek after the Form of an Arch which shall be the strongest possible, for supporting so great a Weight. And it is very surprizing that no body has attempted it. Instead of that, all People have contented themselves with constructing circular Arches; not knowing that different pressures against the Arch, in different Places, require different Curvatures, which does not

" answer

“ answer in a Circle where the Curvature is all alike. A Circle, it is very true, is very easily described, and that may be one reason for making use of it : But surely, the Description of the Curve here given, is very easy by the foregoing Table, and can create no difficulty at all. If there be any difficulty in the Practice, it is only in cutting the Stones of a true Curvature, to fit the Arch exactly in all Places ; but this is easily managed with a little care, by taking proper Dimensions, observing that every Joint must be perpendicular to the Curve in that Point.

“ A CIRCLE, or any other Curve where the Curvature is not properly adapted to the Weight sustained, is not capable of sustaining so vast a Weight, but must in time give way, and fall to ruin ; except the Mortar happen to be so strong as to keep it together. On the contrary, the Arch here described, sustaining every where a quantity of Pressure proportional to its Strength will never give way, so long as the Piers, which are its Basis, stand good ; but by virtue of its Figure, will stand firm and unshaken, as long as the Materials the Arch is made of will last.”

IN asserting this Arch to be the strongest possible, I presume he does not mean to prefer it to the Semicircular ; because this would be manifestly to contradict what he says himself concerning the Semicircular Arch in the 307 Fig. “ That such an Arch will be stronger than any other.” As to the Form of the Catenary, if so call’d, (its Name being not mentioned in Fig. 311) it appears to be a very strong one : The Height and Width on the Chord or straight Line being the same as the Semicircular, and drawing nearer to the Line of the lateral Pressure, if built on Piers, the Arches will form such a Truss against each other, as to cause a central Pressure direct on the middle of the Pier or Piers, which makes the bearing of the Foundations on the Ground the more easy. But I cannot see, why this Form should be of a better Construction than the Semicircular, which he says indeed (but for what Reason I know not) “ Is not a commodious one for a Bridge ;” though their Heights and Widths on the Chord are the same. As for “ the different Pressures against the Arch in different Places requiring different Curvatures, &c.” if by the different Pressures against the Arch he means against the Sides, the Semicircular is stronger than the Catenary ; and if the Pressure is extraordinary great there, then the Semicircular must be the very strongest ; “ because an Arch that can sustain itself will more easily sustain an additional Weight :” and being further from the Line of the lateral Pressure than the Catenary, is the more able to resist that inward Pressure ; notwithstanding they are both able to bear any Weight proportionate to their different Forms. For the number of Stones which form the circular Course were design’d with Joints to render the Arch flexible, as in all Buildings they will naturally settle to each other, for the support of various and unequal Bearings. I’ll only ask one Question, whether the Ponderosity that is laid on the Arch itself can be equal on the Top, Bottom, and Sides ? If not, then this proves, that all Arches have different Pressures on them, and none can equal the Semicircular for their Support.

NOW in case of an extraordinary Pressure on the Spandrel K, in the Ellipsis, it would be the only means of securing the Crown of that Arch from falling in.

THE Construction of the Masonry of this Form greatly surpris’d me ; when on examining the Plate 41, and Fig. 311, I found all the Courses of the Stones set horizontally, and only the Ends curv’d or fitted to the form of the Arch (so call’d.) This manner I thought could not be his Design ; till I examined the Description, where he says, “ If there be any difficulty in the Practice, it is only in cutting the Stones of a true Curvature to fit the Arch exactly in all Places.” I hope he does not imagine, that an Arch of such Construction, can be put in practice ; or, “ by virtue of its Figure, will stand firm and unshaken.” I absolutely declare to the contrary : It will stand no longer than the Center remain under it ; and no Mortar can be made for the Arches of a Bridge that will preserve it from falling ; that being always subject to wet and

dry,



dry, and all changes of Weather. No Curve can stand without being form'd with a circular Course in Stone, Bricks, or such like Materials, (Wood work is out of the question) therefore it is no way "surprising that it has not been attempted." But the way to form a Judgment of its Strength and Utility, would be, to divide it into a number of Arch-Stones; and to point out where the Center or Centers must be for the Joints or Beds to be drawn from.

If he thinks I err in what I have asserted, let him peruse the Works of antique and modern Architecture, and try whether he can find an Arch of his Construction. If any such have been seen, it must first be turn'd over rough, and then plaister'd over, and marked with artificial Lines for Beds and Joints drawn to amuse. Or else it must be set with a very strong Cement, and placed only for show, and the Span or Width very small: Or, like the flat Arches by *Monsieur le Comte D'Espie*, whose Construction depends entirely on the strength of the Plaister, not on his flat Bricks. But they cannot be put in practice for Bridges, or for any other Works, where there is a great Pressure: No Arch can stand without a Key in Stone, Bricks, or such like Materials.

OBSERVATIONS on Mr. Muller's Elliptical Arch, in his Treatise on Practical Fortifications, &c.

IN the Preface Page 10th, "It has hitherto been imagined, though without any Foundation, that an Elliptical Arch is weaker, and presses the Piers with a greater force than a circular one. The Reason which Authors pretend to give for this Supposition is, that all the Joints of a circular Arch when produced meet in the same Point, without considering that all low Arches require less Masonry than those which are higher."

THE Strength of the Semicircular requires no better Illustration to convince this Author of its Superiority, than the Form (not the practical Work or Masonry) describ'd by Mr. *Emmerson* in Fig. 307. And I must beg leave to inform him, it is not the Quantity of Materials, whether more or less; but it is the Make or Shape of the Arch-Stones that forms the Curve. Besides, in the Semicircular, the greatest Pressure falls on the Haunches, which keep the Arch secure on the Crown: But in an Ellipsis, there is certainly greater Pressure on the Crown (especially when Buildings are over them) than the Semicircular, as it is longer and flatter on the Top; therefore an Ellipsis cannot resist the extraordinary Pressure that the Semicircular will bear; and therefore may spring in the Haunches, which is the weakest Part, but in the Semicircular it is the strongest: And the further you extend the Center below the Chord or straight Line of an Arch, the weaker it will be, as in the Ellipsis, because the Joints or Beds will be nearer to a parallel, as I before observ'd.

A SEGMENT of a Circle the same Height as an Ellipsis, is stronger than the Ellipsis, if the Stones are drawn from the center point of a Semidiameter, and will have less Pressure on the Piers, they being nearer to the Line of the lateral Pressure, therefore will truss with great force against the foot of each other, and throw their whole Pressure on the Center or middle of the Pier, which cannot be the case in the Ellipsis.

AGAIN, (see Page 63) "The erroneous Notions of other Authors, who have looked upon the circular one as the strongest and the best, without being able to give any other Reason than because all the Joints meet in the same Point, not considering that the same thing is so in all Arches made of parts of Circles"—I hope he does not mean in the Ellipsis: If he does, that I deny, and must inform him, that his Assertion is erroneous. If an Arch is drawn from different Centers its Curvature varies, therefore the Moulds or Patterns must be made by

Lines drawn from each Center, not from one as in the Semicircular. For I presume, if he was ask'd, how I should find a central Point for the forming the Arch-Stones in a Semicircular one, he would order me to take it from the central Point on the base Line: If so, then why should not I take it from the two central Points on the base Line in the Ellipsis? If they were all taken from the lower Center, their Bearings would be imperfect, for their Joints must all meet in the same Points they are drawn from, and you may as well take a central Point considerably below or above the Chord or straight Line in a Semidiameter, and by such wrong Points you may make the Semicircular Arch to fall as soon as the Center on which it is set is taken away from under it. False central Points will cause false and unequal Pressures and Bearings.

I SHALL here make an Observation or two on this Author's Remarks on *Westminster Bridge*. In the first Place he tells you, "That this Bridge, (Page 64th) is so very high, that it is with the utmost difficulty, that heavy loaded Carriages can get over it." Page 259, "I should be glad to know how far this Descent may be carried, since it is plain, that the Slope of: *Westminster Bridge* is too much by a good deal, according to the best Judges; for the Beauty: of any Bridge consists, in that one may see from one End to the other, like a Street." Page 265, "Two Drains or Gutters are made lengthways over the Bridge, one on each side next the Foot-Path, of about six Feet wide, and a Foot deep; which being filled with small pebble Stones, serve to carry off the Rain Water that falls on the Bridge, and to prevent its filtering through the Joints of the Arches, as often happens. Again, For when the Water passes thro' the Joints of the Arch-Stones, as it does at *Westminster-Bridge*, it has an ill effect to the Eye, because those Stones that are wet, look of a black Colour, &c."

I AM of opinion, this Critick deals only in hearsay. There's no doubt but the ingenious Mr. *Labely* had a just reason for the Ascend and Descent he has given it; for 'tis plain, that by such proportionable Rise it would appear noble and graceful: besides, such a Fall is the only means to keep it dry and carry off the Water, which would otherwise sink into the Haunches, and also filter through the Joints of the Arches. But he says, "the Beauty of any Bridge consists, in that one may see from one End to the other," which (without Buildings erected on it) would look flat indeed, especially in a Bridge of 1220 Feet long. I would only ask, which is the most easy for heavy loaded Carriages to be drawn over? A Bridge that is dry with a Fall as at *Westminster*, or, the drawing such Loads through a Slough, as must be the case, if he can stand at one end and see the Ground at the other: And, whether the Water will not filter through his more than Mr *Labely's* Fall? How is the Water, after a sudden Thaw, &c. to be carry'd off a Bridge of such extent? I answer, not with such a Fall as he recommends, "so that you can see the Ground at both Ends, or with Drains or Gutters fill'd up with small Pebbles (six Feet wide and one Foot deep) made length ways over the Bridge."

I WISH this Author had kept his Language within the Bounds of Candour, and not set so great an Estimation on his own Abilities, by attempting to lessen the Reputation of Men of real Merit.

I SHALL now offer some Observations relating to the Appendages or additional Supports to Arches, wherein Art may be made use of for their Security.

THE Semicircular wants no addition in the Arch itself, but 'tis very necessary to have a strict regard for the Security of the Spandrels and Haunches, and the Abutments cannot be too strong. The overloading the Crown and slighting the Spandrels and Haunches may endanger this, or any other Curve. Therefore all Arches must be well secured at the Foot, and to save Expence, Rouble-work may be apply'd (though in general misapply'd, being put where the Strefs of the Arches. Therefore I have given a Section of the Inside-work, wherein I have drawn a rough Arch,



Arch O, extending itself unto the middle Arch-Stone on the side mark'd L. This, I presume, will secure the Rouble-work, and keep the Arch in its Center. As for Arches revers'd in the Spandrels of a Bridge, I think they can be of no use; but in the Foundation of a Building under the Voids, they are very necessary to keep the Building in Equilibrio. For their Pressures being unequal, you must observe, that there is the weight of one, two, three, or more Stories to keep the foot of each of them in their Places; for which reason the Crowns must naturally sink equally with the rest of the Foundation. But in their Construction on the Spandrels, &c. of a Bridge, there does not appear a sufficient Weight on the foot of this counter Arch, to resist the Pressure, which will be upwards, especially against an Arch of a large Extent.

As to the Elliptical Arch, we are not to suppose it placed on a Rock: were it so indeed, it wants no Aid, only great Care is to be taken of the Spandrels and Haunches, (the Abutments, as I before observ'd, cannot be too strong:) But where it is placed on a soft Bottom, and subject to Torrents, or the flux and reflux of the Tide, a little Addition of Art would not be amiss.

CONCERNING a Proposal for an additional Strength to the Elliptical Arch, Mr. Martier delivers his Opinion thus: (a)

"THE Joggles, propos'd to be put in to keep the Arch-Stones from sliding by each other, and by that means to take off  $\frac{1}{2}$  of the weakness of the Elliptical Arch, and said to be of (b) a new Invention, I believe, have not been so well consider'd as they ought to be. I apprehend these Joggles to be expensive and to add no strength.

JOGGLES properly plac'd, whether wrought on the Arch-Stone, or a piece of Stone proportionate to each let into them, about six Inches thick, being three Inches into each, see Fig. 4th, are far better for the strengthening of a weak Arch, because no Arch-Stone can slide from them, where they are introduced; besides, their extending into each other further than the top of each Arch-Stone, makes it so strong, that no just Calculation can be ascertain'd of the superior Strength. If it was so to happen, that the Pressure of each Bed or Joint was taken off, the Joggles would support the Arch from falling, where the Pressure is not too violent, and they are not so expensive as may be imagin'd.

THIS Method is far preferable to the driving Wedges of Iron\* into the top of the Joints, which Project appears to me to be very ill judg'd. For when the Arch is set on the Wood Center, it should not be confin'd too close on the upper part towards the Crown; for on striking, or taking down the Center, there are very few Arches but will settle a little, and by that means will throw an equal Pressure of each Bed or Joint against each Arch-Stone: but if confin'd on the upper part of the Beds or Joints, and any Accident should happen to the Piers or Abutments, the consequence would be, that the Joints would open below, which will take off that Pressure on each Bed, and throw the whole Force on the upper Ends of each Joint; and the Wedges would prevent the Stones closing against each other, so that the whole Dependance would be on the Iron Wedges. But as long as an Arch is well loaded on the Crown, and continues close on the inside, there is no danger of its falling, as the wider part of the Voussoirs or Arch-Stones cannot drop

through

a Mr. Martier's Opinion—See London Magazine, March, 1760,

b Not new: For Joggles are often used in Masonry to prevent Stones slipping from each other, as in the Joints of the Architrave over Columns in large Porticoes, &c. being similar to straight Arches.

\* The Report of this Method being made use of, I hope, is entirely without any Foundation, as Clamour, and perhaps Prejudice may have spread its Wings abroad. Therefore I have given my Sentiments on that Practice, that the young Student may avoid it.

through the space of the lesser Ends. But if Iron Rails be placed over Arches to ease the Crowns, this would be taking off the very Pressure that should resist the Pressure from the Haunches.

No general exact Rule can be given for the Proportions of Bridges, because all Bridges have not their Foundations alike, and therefore must come under the various Considerations of their Lengths and Widths; Strength, Safety, Utility, and ease of Ascending. Some Soils requiring large Foundations where there are small Arches: Others, where they are built on Chalk, &c. lesser Foundations, with large Arches. Where the Soil is inclining to be soft, the Arches should not be too large, (I mean only where Piles are not used.) And lastly, Care must be taken to proportion the Foundations so as to keep them and the different Pressures of the Arches in a State of Equilibrium.

THE ingenious Mr. Simpson, delivering his Opinion on the Strength of the Elliptical and Semicircular Arches for a \* Bridge, mentions the Efforts of Arches to overturn their Piers. To this it may be reply'd—That if the Masonry of the Piers be properly executed, and proportion'd to the Weights and Pressures they are to receive, whether greater or less;—and if the Arches and Piers be so proportion'd as to have an equal Pressure on the whole Foundation they are fix'd on,—they cannot be in danger of overturning. For, if the Bed of the River (though of equal Texture) should not be able to sustain the whole Pressure, and the Arches on the Piers, together with their Foundations, (though calculated to be in a State of Equilibrium) should settle, yet will they descend equally, and remain in a fix'd perpendicular State. But if Arches be so constructed, as to have a very unequal Pressure, and the Bottom of the River be soft or defective, then there is a probability of the Piers settling more on one side than the other. As is the Case of an old § Stone Bridge, where the Center Arch is a Gothic one, 19 Feet wide; and the two lesser ones are long Ellipses, 17 Feet 8 Inches each. The Height from high Water to the Crown of the Center Arch is exactly double the Height of each of the Side Arches; and notwithstanding the Piers are above  $\frac{1}{2}$  of the Width or Opening on the Chord of the Center Arch, and the Ellipsis on the Chord or straight Line about 1 Foot 10 Inches lower than the Chord of the Center Arch, yet each Pier is settled five Inches lower on the Sides † next to the Banks than they are next to the Center Arch; which proves that the Construction of the Elliptical Arches was not sufficient to resist the Pressure of the Center Gothic Arch, so as to keep the Piers in a perpendicular State.

AFTER the many Experiments and Calculations of Mathematicians, to prove the Strength of an Arch, they never thought of one of the most principal Parts, which is, the Piers. For instance: I think it has been a common Direction to Workmen and the Student, never to make the Pier in Thickness above one fourth of the Width of the Arch, nor less than one sixth. But suppose a Pier to be placed, to receive the Feet of two Arches, the one 50 Feet in the Opening on the Chord or straight Line, and the other about 42 Feet 6 Inches. Then, if the Foundation projects equally on each Side of the Pier, Quere, Whether the Arch 42 Feet 6 Inches is equal in pressure on the Pier and Ground with the Arch 50 Feet, to be calculated according to the different Curves? This I would humbly recommend to their Consideration. And in order to find out the true Pressure, I would also recommend, to form a Model in Miniature, with Pieces of Wood, or soft Stone, and prepare them as directed at large in the Sections, (Fig. 5th,

Plate

\* For Black Fryer's Bridge.

§ St. Olive's in Norfolk.

† Erected on an Oozy Soil.



*Plate 60th*) with a Pier between each of them out of a solid piece or pieces, placing the Ends on Blocks for Abutments, and setting the Piers on something, that the Weight and Pressure of the Apparatus will sink into\*. Such practical Experiment will enable us to form a more exact Judgment of the Strength and Pressure of so many Tons weight, than a speculative Division and Subdivision upon Paper; or the chipping out the Stone of a large solid Block to form the Arch, See *Fig. 6.* and setting it on two Blocks and loading the Top, to prove its Strength: That will not prove it, neither is this an Arch in Masonry, but a Curve or Arch Line; for this being without Flexibility, will break in the weakest Part, which is the Top: for 'tis impossible to break on the Sides, because the Block is left solid. But where there are Arch-Stones, if any Wring or unequal Pressure happen, they will naturally settle close to each other, without its being visible to the Eye. Now if two Blocks of equal Dimensions were chipt out with a semicircular or elliptical Form, for a Bridge, Piazza, &c. and one end of each of them fixed together, so as to make one upright Joint in the middle on the top of the Pier that supports them and the other Ends on Abutments, then the upper Beds of the Blocks would be level. Suppose, that by loading or building on that upper Bed, the Pier should settle with its Weight (as it is rare to find Buildings that will not) or should sink by some unexpected Cause: How would these two chipt-out Blocks and upright Joint act on that Pier?—Or how can the true Pressure of an Arch of any Curvature be found in one Block of Stone?—I answer, it cannot be found at all, as it will not settle towards the Center of the lateral Pressure, nor can spring in the Haunches. But an Arch with Arch-Stones will press towards the lateral Pressure, or spring in the Haunches (as I before observ'd) because of its being flexible. So that in an Arch of this latter Construction, a more exact Judgment can be form'd of the Center of Gravity, Pressures and Bearings, than from one made out of a solid Block of Stone. On Supposition that every part of an Arch was of equal Thickness, cut out of one Piece, and proportioned to the Opening for the Weights it is to receive, then, before it receive its Burdens proportionate to those of Curves with Arch-Stones, it would break in more than one Part and fall, as Arches must receive various and unequal Pressures. Where Arches with Arch-Stones are properly constructed, and on a Soil that can be depended on, even then, no exact Calculation can be made of their Weights and Pressures: For we must consider, that the very Materials apply'd are not of an equal Body, the Density of Stone being various. Therefore, in the Construction of a Bridge, Piazza, &c. if they pretend to ascertain the exact Weight and Pressure to a Pound, Hundred, or Ton, they will be liable to frequent Mistakes. Let them take a Piece of each of the following Stones, suppose 8, 10 Inches, or a Foot Cube of Portland, Bath, Ketton, or various other Stones from the North, &c. nay even a Piece from each of the different Beds of Portland—and weigh each of them; so may they detect the Uncertainty of their general Calculations, and perceive the superior weight of Evidence from Experience grounded on Facts.

\* The following Method, I presume, would answer for its Tryal. Take two or more Tin-Pans or Wood Boxes, according to the Number of Piers, to be longer and wider than your intended Foundation; and to be made a proportionate Depth according to the Size of the Model. Fill these Pans with Pipe-Clay well beaten and tempered; and with a straight Rule strike it off level with the top Edge of your Pans. Around the inside Edge make a Trench to the Bottom, and let it stand 'till it become stiff. Then place your Piers on them, and fix them in their proper Place, taking care that the whole Apparatus when put together be exactly level on the Clay. When done, keep tempering your Clay by slow Degrees with an equal Quantity of Water in each Trench. This will discover a true Pressure: by the sinking of the Piers into the Clay, and by moistening it gradually, you may form some Judgment of its Effects on a Chalk Bottom, a Gravel, and an Ooze. By this Method, you will discover how far a Pier will sink before the Arch will fall in: and if you put the whole Apparatus together dry and without any thing in the Joints, you will see how every part will act when it is sinking, by the opening or closing of the Joints. Also, if one part of the Foundation for a Pier of a Bridge is a Gravel, and the other inclining to be loose and sandy, by putting a larger Quantity of Water into your Tin Pan for the Sandy Bottom, than you do for the Gravel, you may form a Judgment of the different Pressures on each Bottom, and what Proportion will be necessary for the Foundation on the Sandy Soil, to keep the Pier in Equilibrium with the Pier on the Gravel; and will also discover the true Pressure of the Arches of different Dimensions on one Pier.

When the Mathematician has by his Calculations form'd an Arch which he imagines to be the strongest, let him make or cause to be made a Model or Apparatus as describ'd, whether from one or more Centers; and by tempering the Clay, he may discover whether his Calculations will answer with the Actions of the Apparatus, and what Weight such Arches are able to bear for the different Soils.

N. B. The Lead for the Parapet is to serve each Model, which will prove the different Pressures of the Semicircular, Elliptical, &c. with the same Weight.

E

THUS

## 158      PRACTICAL REMARKS ON ARCHES, &c.

THUS have we seen the Necessity for Arch-Stones, which will always support themselves with their Burdens, where the sinking of the Piers is not very considerable : But no Arch with Arch-Stones can stand, without some proper Foundation.

I HAVE also given an Elliptic Arch, which comes nearer to the Semicircle with its Dimensions. See *Fig. 4.*

I SHALL conclude with a Remark, omitted in the former part of this Work. \* Mr. *Emmerson* says, "A Circle, it is very true, is very easily describ'd, and that may be one reason for making use of it."—This seems to imply, That the Antients were ignorant of the Construction of any Arches except the Semicircular, because they constantly practis'd this ; whereas I rather account for it thus.

THE Origin of Science was from natural Ideas ; and when the Semicircular Form of an Arch was introduced, no doubt but it was adjudg'd to be the strongest, on account of its easy Bearings, requiring no Aid or Embellishments to add to its Beauty or Strength. There want no new Proofs of the masterly Skill of the Antients, as sufficient Monuments remain to testify their noble Taste, not only in Architecture, but in Sculpture, Painting, &c. and even in Geometry ; though the incessant Revolutions and Depredations of Time may have depriv'd us of many of their most valuable Works. If in those Ages of Simplicity and natural Knowledge, they arrived to so great a pitch in Architecture, Sculpture, and Painting, &c. there's no doubt but the Geometricians were as eminent ; since all real Science is equally founded on Nature and natural Proportions. But Manuscripts are form'd of less durable Materials than Marble or Brass. The *Greeks* and *Romans* built for succeeding Ages, as being conscious that their Models would be the Admiration of all Posterity. But though this enlighten'd Age has those noble Originals to copy from (a great Advantage) yet, instead of endeavouring to improve upon them, we are fond of every childish gaudy Toy. And thus it must be, while we neglect to study Nature, and prefer the Illusions of Fancy to the Dictates of solid Judgment.

THE Remarks I have made in this Tract, I hope will be acceptable to every impartial Judge ; and likewise tend to form the Ideas of the young Student by the most familiar Method of Illustration. And if what I have offer'd should meet with any severe Criticism, I have the Consolation to know, that if call'd upon, I can apply these easy Principles to Practice.



# A N

## E X P L A N A T I O N

### T O E A C H

## P L A T E.

PLATE I. THE Plan and Elevation of a small Building 30 ft. in front by 28 ft. deep. The Rooms are divided in the following manner.

$\left. \begin{array}{l} a, \text{ Passage} \\ b, \text{ Parlour} \\ c, \text{ Large Parlour} \\ d, \text{ Stair-Cafe} \end{array} \right\}$	11 ft. high.	$\left\{ \begin{array}{l} e, \text{ Clofet} \\ f, \text{ Pantry} \\ k, \text{ Kitchen} \end{array} \right.$
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The Chamber Floor consists of three Rooms, and Clofets over  $f$  and  $a$  :—10 ft. high.

PLATE II. Another small Plan and Elevation 30 ft. square, divided in the following manner.

$\left. \begin{array}{l} a, \text{ Passage} \\ b, \text{ Parlour} \\ c, \text{ Large ditto} \\ d, \text{ Pantry} \end{array} \right\}$	11 ft. high.	$\left\{ \begin{array}{l} e, \text{ Scullery} \\ f, \text{ Clofet} \\ g, \text{ Stair-Cafe} \\ K, \text{ Kitchen} \end{array} \right.$
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The Chamber Floor has one Room over  $K$ , with recess for a Bed over  $d$  and  $f$ ; two Chambers over  $b$  and  $c$ , and Clofets over  $a$  and  $e$ .—10 ft. high.

PLATE III. Plan and Elevation of a small Building design'd for a Summer-Retreat, to be placed on a pleasing Eminence, and divided as follows.

$\left. \begin{array}{l} a, \text{ Hall} \\ b, \text{ Parlour} \\ c, \text{ Stair-Cafe} \\ d, \text{ Dining-Parlour} \\ e, \text{ Door-way to Stair-cafe} \end{array} \right\}$	$\left\{ \begin{array}{l} ff, \text{ Clofet and Scullery} \\ g, \text{ Store-Room or large Pantry} \\ h, \text{ Passage to} \\ ii, \text{ two small Lodgings for Servants} \\ K, \text{ Kitchen} \end{array} \right.$
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N. B. The Stair-Cafe is illuminated with Attic Windows opposite to each other. Over  $b$  and  $d$  are two Chambers, each Story being 12 ft. high, as also  $a$  and  $K$ .

PLATE IV. Plan and Elevation of a Building design'd to be situate near a City or Market-Town, for a Gentleman or Merchant, with the adjoining Apartments, extends 59 ft. in front, and divided as follows.

$\left. \begin{array}{l} a, \text{ Hall and Stair-Cafe} \\ b, d, \text{ Parlours} \\ c, \text{ Dining-Room} \\ e, \text{ Dressing-Room} \\ f, \text{ Study} \end{array} \right\}$	12 ft. high.	$\left\{ \begin{array}{l} g, \text{ Back-Kitchen or Scullery} \\ h, \text{ Pantry} \\ ii, \text{ Clofets} \\ k, \text{ Clofet to Dressing-Room} \\ K, \text{ Kitchen} \end{array} \right.$
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Note.

Note. If for a Merchant, *e* and *f* are Accompanying-Rooms, the Communication to them at *k*.—The Chamber-Story consists of three Rooms 10 *ft.* high, viz. over *b*, *c*, and *d*, and the Passage mark'd 4 is 5 *ft.* 6 *In.* wide, for a Stair-Cafe to the four Garrets, which are illuminated with Sky-Lights.

PLATE V. A Building design'd for a small Family in a City or large Town. Its Front extends 42 by 33, and contains the following Rooms.

<i>b</i> , Parlour	} 11 <i>ft.</i> high.	{	<i>e</i> , Back-Stairs
<i>a</i> , Hall			<i>g</i> , <i>g</i> , Two large Clofets
<i>c</i> , Dining-Parlour			<i>K</i> , Kitchen
<i>d</i> , Stair-Cafe			

The upper Story 10 *ft.* high, consists of three Chambers over *b*, *c*, and *K*. Over *g*, *g*, are two Clofets. Room over *a*, may be made a Dressing-Room. The Cellar Story 7 *ft.* 6 *In.* high to be apply'd to such necessary Uses as best suit the Inhabitant.

PLATE VI. The Plan and Elevation of a Building design'd for a City or Town: Its Front extends 46 *ft.* and consists of the following Rooms:

<i>a</i> , Hall and Stair-Cafe	} 12 <i>ft.</i> high.	{	<i>f</i> , Small Scullery
<i>b</i> & <i>c</i> , Parlours			<i>g</i> & <i>i</i> , Clofets
<i>d</i> , Dining-Room			<i>b</i> , Back-Stairs
<i>e</i> , Clofet			<i>K</i> , Kitchen

The Cellar-Story 7 *ft.* 6 *In.* high. The Chamber-Floor 10 *ft.* high, consists of the four Rooms over *b*, *c*, *d*, and *K*: over *e*, *f*, *g*, *i*, Clofets. The Back-Stairs communicate to the Garret-Story, which consists of 6 Rooms.

PLATE VII. The Plan and Elevation of a House for a small Family in a City, &c. 40 *ft.* 6 *In.* in front, and is laid out as follows.

<i>a</i> , Vestibule	} 12 <i>ft.</i> high.	{	<i>f</i> , The Store-Room
<i>b</i> , <i>b</i> , Two large Parlours			<i>g</i> , Pantry
<i>c</i> , Stair-Cafe			<i>b</i> , Scullery
<i>d</i> , Small Parlour			<i>K</i> , Kitchen
<i>e</i> , Back-Stairs illuminated from the Roof			

The Chamber-Floor, 10 *ft.* 6 *In.* high, contains five Rooms over *b*, *b*, *g*, and *b*, *K* and *d*, Dressing-Room. Over *a* and *f*, Clofets. Only the Back-Stairs communicate with the Garret-Floor, consisting of 5 Rooms 10 *ft.* high.

PLATE VIII. A Plan and Elevation of a Building which extends 41 *ft.* in front, by 39 *ft.* 6 *In.* and is designed for a Gentleman who is center'd in a Row of Houses two Stories high, being his own Estate. But his adjoining Neighbours may retain Shops in front, tho' it should so happen that he is in want of additional Rooms, in order as little as possible to lessen the Value of his Rentals. This Hint I have given, to take from the back part, and leave the Shops in front, to answer his Plan, and build as here laid out if the Ground will suit.

<i>a</i> , Hall and Stair-Cafe	} 12 <i>ft.</i> high.	{	<i>f</i> , Store-Room
<i>b</i> , Keeping-Parlour			<i>g</i> , Pantry
<i>c</i> , Great Parlour			<i>b</i> , Scullery
<i>d</i> , Dining-Room			<i>i</i> , Clofets
<i>e</i> , Back-Stairs			<i>K</i> , Kitchen

The



# An EXPLANATION to each PLATE. 21

The Chamber-Floor consists of 4 Rooms, 11 ft. high, *b*, *c*, *K*, and *f*, which last is a Dressing-Room. The Garrets have no other going to but by the back Stairs, and they consist of four large Rooms; or the Room over *a* and *f* may be divided into two, the whole being 9 ft. high.

PLATE IX. The Design of a Building for a small Family in a large Town, which extends 54 ft. in front, and is laid out as follows.

<i>a</i> , Hall and Stair-Cafe	} 12 ft. high.	<i>f</i> , Back Stairs
<i>b</i> , <i>c</i> , Parlours		<i>g</i> , Passage
<i>d</i> , Dining-Room		<i>h</i> , Pantry
<i>e</i> , Passage from Kitchen to Parlours, illuminated by the 3 openings with Arches & Stair-Cafes		<i>i</i> , Clofet
		<i>j</i> , Scullery
		<i>K</i> , Kitchen

The Chamber Floor is 11 ft. high, and contains five Rooms over *b*, *c*, *d*, *K*, over *i* and *b* is a Dressing-Room, and *j* a Clofet. The Communication over *e* is illuminated with three Openings as below, with Banisters at each end-opening. The Garret Floor is 9 ft. high, and contains a Landry and five Lodging-Rooms, having only the back Stairs to them, and being illuminated with Sky-Lights on the ends of the Roof.

N. B. The Bow is carried no higher than the Parapet.

PLATE X. Is a Design for a Building 56 ft. in front, for a Gentleman or Tradesman in a City or Market-Town, or on a Spot where there is a Plan of an old Building of the same external Form.—The Rooms are divided as follows.

<i>a</i> , The Hall divided from the Stair-Cafe with 3 Openings supporting the Landing	} 12 ft. high.	<i>e</i> , Passage
<i>b</i> , Small Parlour		<i>f</i> , Back Stairs
<i>c</i> , Great Parlour		<i>g</i> , Back Kitchen
<i>d</i> , Dining-Room		<i>h</i> , <i>b</i> , Pantry and Clofet
		<i>i</i> , Clofet to Kitchen and little Parlour
		<i>K</i> , Kitchen

PLATE XI. Is the Chamber-Plan and Garden-Front to the foregoing Plate: the Rooms as follow.

<i>k</i> 's Passage and landing to Stair-Cafes	} 11 ft. high.	<i>m</i> , Dressing Room
<i>l</i> , <i>l</i> , <i>l</i> , <i>l</i> , Four Bed-Rooms		<i>n</i> , A Clofet

Over *k*'s, *n*, *m*, are 3 Rooms for Garrets, as dotted, 10 ft. high. Communication by back Stairs *o*.

PLATE XII. Is another Design with a less Court for a Gentleman or Wine-Merchant, in a large Town, &c. the Front extending 69 ft. 6 In. The Rooms are prepared for the following Uses.

<i>a</i> , Hall and Stair-Cafe	} 12 ft. high.	<i>f</i> , Study or Compting-Room
<i>b</i> , Keeping Parlour and <i>x</i> , Clofet		<i>g</i> , Back Stairs
<i>c</i> , Great Parlour		<i>h</i> , Scullery
<i>d</i> , Dining-Room		<i>i</i> & <i>j</i> , Pantry and Clofet
<i>e</i> , Store-Room		<i>K</i> , Kitchen

## 22 An EXPLANATION to each PLATE.

*N. B.* The Cellar Story, 8 *ft.* high, to be vaulted for the Reception of Liquors. The Cells I would recommend to the Direction of the Proprietor, as knowing what will best suit his Convenience.

PLATE XIII. Is the Chamber Plan of the Garden Front to the foregoing Plate.

<i>l, l,</i> Landings	} 10 <i>ft.</i> 6 <i>In.</i> high.	<i>o, o,</i> Small Lodging Rooms
<i>m, m, m, m,</i> Four Bed Rooms		<i>p,</i> Landing to back Stairs
<i>n,</i> Dressing-Room		<i>q,</i> A Closet

The Garrets 7 *ft.* 6 *In.* high, have only Sky-Lights, and are to be partitioned off as the Owner thinks proper for the Convenience of his Family.

PLATE XIV. The Plan and Elevation of a Building, which extends, with the adjoining Apartments, 100 *ft.* in front; to be situated on an agreeable Spot in a City or Villa: The Rooms design'd as follows.

<i>a,</i> Hall	} 15 <i>ft.</i> high.	<i>i,</i> Store-Room
<i>b, c,</i> Parlours		<i>l,</i> Butler's Pantry
<i>d,</i> Dining-Room, with 2 Niches for Tables		<i>m,</i> China, &c. Room
<i>e,</i> Withdrawing-Room		<i>K,</i> Kitchen
<i>f,</i> Stair-Cafe		<i>n,</i> Pantry to Kitchen
<i>g,</i> Back Stairs		<i>o,</i> Back Kitchen
<i>h,</i> Study		<i>m, m,</i> Two Closets

*N. B.* Servant's Hall and the other requisite Conveniencies in the Cellar Story, 9 *ft.* high: the going to them is under the Stairs, *g.*

The Chamber Floor consists of the following Rooms, 12 *ft.* 6 *In.* high. Over *a,* is a Lodging Room and two Closets as dotted: *b,* Dressing-Room: *c, d, e,* Lodging Rooms: *o,* is a landing to both Stair-Cafes. Only the back Stairs lead to the Garrets, which are six in number, over the two large *d* and *e* are three Lodging Rooms, 9 *ft.* 6 *In.* high.

PLATE XV. Plan and Elevation of a Building for a Gentleman with a middling Family. (It often happens in a City or Town that the Ground is lower on the back side than the front: I have therefore placed the Kitchen (under *d,*) Pantry and Conveniencies 10 *ft.* high, level with the Ground on the back or Garden front.) The principal Rooms are divided as follows.

<i>a,</i> Hall	} 12 <i>ft.</i> high.	<i>e,</i> Withdrawing Room
<i>b,</i> Parlour		<i>f,</i> Study
<i>c,</i> Eating Parlour		<i>g,</i> Stair-Cafe
<i>d,</i> Dining Room		<i>h,</i> Back Stairs

PLATE XVI. The back or Garden front and Chamber Floor to the foregoing Plan, as follows.

<i>i's</i> Are Passages to each Room	} 11 <i>ft.</i> high.	<i>l,</i> Dressing Room
<i>j, j,</i> Closets		<i>m,</i> Small ditto, or large
<i>k, k, k, k, k,</i> Five Bed Rooms		Closet

Note, There are the same number of Rooms and Closets on the Garret as the Chamber Floor, being 9 *ft.* high.

PLATE XVII. A Design of a Building for a Gentleman of opulent Fortune, adapted for a City or Villa, 80 *ft.* in front. The Rustic or Basement Story I propose to be 9 *ft.* high, and by descending 2 *ft.* that there might not be too many Steps to the principal Floor, and are design'd only for Offices, for the Servant's Hall, Pantry, &c. and Cellars under *f, g, i.* The Kitchen is to be at some small Distance from the Mansion, communicating by a small Arcade. The Apartments on the principal Floor as follows.



# An EXPLANATION to each PLATE. 23

<i>a</i> , The Hall and Stair-Cafe 25 ft. cube	} 15 ft. high.	<i>f</i> , Withdrawing Room
<i>b</i> , Parlour		<i>g</i> , Dressing-Room
<i>c</i> , Eating Parlour		<i>b, b</i> , Bed Rooms
<i>d</i> , Library or Study		<i>i</i> , Back Stairs illuminated from the Roof,
<i>e</i> , Dining-Room (with a cove Cieling, 20 ft. high.) Vide Section		

The upper Story 10 ft. high, and to be divided into 7 Rooms over *b, c, d, f, g*,  
*b, b*: a small Stair-Cafe over *e*, which *e* is divided into two Lodging Rooms  
for Servants. I propose no Rooms in the Roof: If there are, to be lighted with  
Sky-Lights in the Valley.

PL. XVIII. Elevation and Section to the foregoing Design.

PL. XIX. Is a Plan for a Person of Quality's Mansion in a Town or Villa: The Area of  
the Rooms in front extends 130 ft. long: The Rustic or Basement Story, 10 ft.  
high, is divided into a number of Rooms for the Conveniencies of the principal  
Servants. The Kitchen and Conveniencies belonging thereto are to be detached  
at some distance with a Colonade adjoining to the Mansion, in order to prevent  
Steams and Heats ascending into the principal Apartments, which would be very  
incommoding.

The Rooms on the principal Floor are distributed as follows.

<i>a</i> , Hall	} 20 ft. high.	<i>b</i> , Clofet
<i>b</i> , Saloon		<i>i, i</i> , Stair-Cases lighted from the Roof
<i>c, c</i> , Withdrawing Rooms		<i>k</i> , A small Stair-Cafe up to Dining Parlour and Side-board
<i>d, d</i> , Parlours		<i>l, l, l</i> , Picture-Gallery
<i>e</i> , Dining Parlour		
<i>f</i> , State-Bed Room		
<i>g</i> , Dressing-Room		

In the Attic Story are the same number of Rooms, only with an Addition, viz.  
The middle Room over the Gallery is to be divided into three Rooms, and *f* and  
*b* into two, deducting room for small Stair-Cases into the upper Rooms over *l, l, l*,  
and *e, f, g, b*, which run through, and also communicate to the two Roofs, which  
are lighted from Sky-Lights in the Inside.

N. B. I have not introduced a Library, but propose a spacious one to be erected,  
with a communication by a Colonade, to answer the Kitchen-wing.

PLATE XX. Elevation to the foregoing Plan.

PLATE XXI. Is a Design for a small Parfonage, 35 ft. in front, by 20, consisting of the follow-  
ing Apartments.

<i>a</i> , Vestibule	} 11 ft. high.	<i>d</i> , Stair-Cafe
<i>b</i> , Keeping Parlour		<i>e</i> , Study
<i>c</i> , Best Parlour		
<i>f</i> , Back Kitchen	} 9 ft. high.	<i>i</i> , Clofet
<i>g</i> , Pantry		<i>K</i> , Kitchen
<i>h</i> , Stable		

In the Chamber Story are two Chambers over *b, c*, and Clofet over *a*. Moreover,  
*e, f, g, b, i, K*, is a Lean-to, and by raising the Walls over *f* and *K*, may be made  
small Lodging Rooms, ascended by Steps off the Landing to Stair-Cafe.

PLATE

# 24      An   EXPLANATION   to   each   PLATE.

PL. XXII. Is another Parsonage, 31 ft. by 29 ft. and divided as follows.

<i>a</i> , Passage and Stair-Cafe	} 10 ft. high.	}	<i>c</i> , Large Parlour
<i>b</i> , Parlour			<i>d</i> , Clofet
			<i>e</i> , Study
<i>f</i> , Back Kitchen and Stair-Cafe	} 9 ft. high.	}	<i>h</i> , Stable
<i>g</i> , <i>g</i> , Clofets			<i>i</i> , Chaise-Houfe
			<i>K</i> , Kitchen

The Chamber Story consists of two Lodging Rooms and Clofets over *a* and *d*, 9 ft. high. Over *f*, *g*, *g*, *K*, are two Lodging Rooms.

N. B. If the Stair-Cafe *a* is continued, there may be a Room in the Roof,

PL. XXIII. Is a Plan and Elevation for a Parsonage or Summer Retreat, the Front of which extends 34 ft. by 32 ft. wide, without the Offices, and divided as follows.

<i>a</i> , Vestibule	} 11 ft. high.	}	<i>d</i> , Study
<i>b</i> , Parlour			<i>e</i> , Store-Room
<i>c</i> , Best Parlour			<i>f</i> , Stair-Cafe
<i>g</i> , Passage to Kitchen	} 10 ft. high.	}	<i>m</i> , Small Clofet
<i>K</i> , Kitchen			<i>n</i> , <i>n</i> , Stables
<i>h</i> , Scullery			<i>o</i> , Chaise-Houfe
<i>i</i> , Passage to Clofet and Pantry <i>b</i> and <i>k</i>			<i>p</i> , <i>p</i> , <i>p</i> , May be open or cover'd with Lights on the Roof

The Chamber Story has three Chambers, 10 ft. 6 In. high, over *b*, *c*, *d*. Over *a* and *e* are two Clofets. The Stair-Cafe is carry'd up to the Garrets in the Roof, where the Partitions may be adjusted to the Convenience of the Inhabitant.

PL. XXIV. Is a Design for a small Building to be situate in a pleasant airy Villa, as a Retreat for a Merchant, &c. where divested of the cares of Business he may enjoy the Converse of a few select Friends. The Length of the Front without its Offices is 40 ft. by 34 wide, and laid down as under.

<i>a</i> , Vestibule and Stair-Cafe lighted from the Roof	} 11 ft. high.	}	<i>d</i> , Dining Parlour
<i>b</i> , Parlour			<i>e</i> , Drawing Room
<i>c</i> , <i>c</i> , Parlour and Clofet			<i>f</i> , A small Study
<i>g</i> , <i>g</i> , Passage	} 10 ft. high.	}	<i>k</i> , Stairs to a Cellar
<i>h</i> , Back Kitchen			<i>K</i> , Kitchen
<i>i</i> , <i>i</i> , <i>i</i> , Clofets and Pantry			<i>l</i> , Stable
			<i>m</i> , <i>n</i> , Coach-house & Oat-bing, &c.

On the Chamber Floor, 10 ft. 6 In. high, are the four following Rooms, over *b*, *c*, *g*, *d*, *e*. Over *f* is a Dressing-Room, which serves *d* and *e*. Also a Clofet over the *a* 12: and there are two Garrets, which run through over *a* and *f*, 9 ft. high.

PL. XXV. A Design for a Gentleman, which extends 90 ft. in front, or a Parsonage for one who enjoys a very valuable Benefice. The Rooms are delineated as under, viz.

<i>a</i> , Vestibule	} 13 ft. high.	}	<i>g</i> , Stair-Cafe
<i>l</i> , <i>b</i> , Parlours			<i>h</i> , Back Stairs
<i>c</i> , Study or Library			<i>i</i> , Store Room
<i>d</i> , Dining Room			<i>K</i> , Kitchen
<i>e</i> , Recess for Sideboard & Clofet to ditto			<i>l</i> , Pantry
<i>f</i> , Passage			<i>mm</i> , Clofets
			<i>n</i> , Scullery

The



# An EXPLANATION to each PLATE. 25

The rest of the Conveniencies are on the Cellar Floor.

The Chamber Story, 12 ft. high, consists of 3 Rooms over *b, b, c*. Over *i*, Dressing Room, *a* and *f* Closets.—The Stair-Cafe rises only to one Story: The Back Stairs communicate to the Garrets, which consist of two Rooms over *b, b*, and Closet over *a*: also over *c* are two Rooms; and two small ones over *i* and best Stairs. N.B. The Wall-Plate to lay 9 In. below the Coping to Parapet.

PL. XXVI. A Plan and Elevation of a Building which extends in front 40 ft. by 38 ft. wide, without the Offices, design'd as a Summer Retreat for a Gentleman with a small Family. The Distribution of the Apartments is as follows.

<i>a</i> , Passage	} 12 ft. high.	{	<i>c</i> , Stair-Cafe
<i>b, b</i> , Parlours			<i>f</i> , Passage
<i>c</i> , Dining-Room			<i>g</i> , Store-Room lighted from the Roof
<i>d</i> , Drawing-Room			
<i>k</i> , Scullery	} 10 ft. high.	{	<i>m</i> , An occasional Passage
<i>i, i</i> , Pantry and Closets			<i>n</i> , Stable
<i>l</i> , Dressing-Room			<i>o</i> , Coach-House
<i>l</i> , Closet			<i>p, p</i> , Courts

The Cellar Story 8 ft. high. The Chamber Story 10 ft. 6 In. high, consists of three Chambers, *b, c, d*. Over *a* is a Closet, and *b* 16 a Dressing-Room. No Garrets are design'd in the Roofs, but Rooms are intended to be in the Wings over Kitchen and Coach-House, &c.

PL. XXVII. Is a Plan and Elevation of a Building for a Gentleman of Family, which extends in front 39 ft. by 38 ft. exclusive of the Offices: The Distribution of the Apartments as follows.

<i>a</i> , Hall	} 12 ft. high.	{	<i>d</i> , Great Parlour
<i>b</i> , Parlour			<i>e</i> , Passage
<i>c</i> , Dining-Room			<i>f</i> , Stair-Cafe
<i>g</i> , Study, with covered Cieling	} 10 ft. high.	{	<i>m, m</i> , The Gardener's Apartments
<i>h</i> , Passage to Kitchen			<i>n</i> , Stable
<i>i</i> , Scullery			<i>o</i> , Coach-House
<i>k, k</i> , Closets			<i>p</i> , Harness-Room and Stair-Cafe
<i>l</i> , Store-Room with a Sky-Light			

*p*, is a Passage into the Cellar Story, which is 8 ft. high, leading to the Servants' Hall, Store-Room, &c. and to the Stair-Cafe *f*.

Chamber Floor 12 ft. high, consists of three Chambers over *b, c, d*, with a Dressing-Room over *a*: There are also Lodging-Rooms for Servants, &c. over the Kitchen Wing *i, k, k*, and Stables *o, p*.

PL. XXVIII. Is a Design 40 ft. by 36, for a Summer Retreat, to be situated on an Eminence commanding some extensive Prospects which may exhilarate and add fresh Vigour to the Mind of the wealthy and industrious Inhabitant.

<i>a</i> , Hall	} 14 ft. high.	{	<i>d</i> , Stair-Cafe
<i>b</i> , Little Parlour			<i>e</i> , Closet
<i>c</i> , Dining-Parlour			
<i>f</i> , Passage	} 10 ft. high.	{	<i>K</i> , Kitchen
<i>g</i> , Study			<i>m</i> , Store-Room
<i>h</i> , Passage			<i>n</i> , Closets
<i>i</i> , Back Kitchen			<i>o</i> , Stable
<i>k</i> , Pantry			<i>p</i> , Stair-Cafe to Lodging Rooms over <i>q, p</i>
<i>l</i> , Stair-Cafe to Lodging Rooms over <i>i, K</i>			<i>q</i> , Coach-House

G

The

The Chamber Story 11 ft. high : the Apartments divided into three Lodging Rooms, *a, b, e*, and Dressing-Room as dotted over *c*.

The Cellar Story 8 ft. high, and the going to be under the Stair-Cafe *d*.

## PL. XXIX.

A Design of a House for a Gentleman or Merchant retired from Business, to be placed on some pleasing Eminence in a healthful Soil, and commanding some agreeable Prospects. The Apartments are laid out in the following manner.

<i>a</i> , Vestibule	} 12 ft. high.	{	<i>e</i> , Stair-Cafe
<i>b, b</i> , Parlours			<i>f</i> , Passage to K
<i>c</i> , Dining-Room			<i>K</i> , Kitchen
<i>d</i> , Withdrawing-Room			<i>l</i> , Study
<i>g</i> , Back Kitchen	} 10 ft. high.	{	<i>k, k, k</i> , Closets
<i>h</i> , Store-Room			<i>m</i> , Stable
<i>i</i> , Pantry			<i>n</i> , Coach-House
			<i>o</i> , Coachman's Apartments

*p, p*, are two Yards.

The Chamber Story consists of three Lodging Rooms, *b, c, d*, and Dressing-Room over *b* 12 : also Closets over *f* and *a*, 11 ft. high : The Stair-Cafe to be continued for Rooms in the Roof to be enlightened with Sky-Lights at each end. There are Lodging Rooms for Women Servants over *g, h, i*,—and Lodgings for Men over *o* and *n*. The rest of the Conveniences in the Cellar Story, 9 ft. high : a Communication to be under the Stairs, *e* and *k*.

## PL. XXX.

Is another Design of a Retreat for a Person of Quality or wealthy Merchant : The Rooms distributed as under.

<i>a</i> , Hall and Stair-Cafe	} 15 ft. high.	{	<i>e</i> , Withdrawing-Room
<i>b</i> , Breakfasting-Room			<i>f, f</i> , Communication to each Wing
<i>c</i> , Parlour			<i>g</i> , Library
<i>d</i> , Dining-Room			
<i>h</i> , Scullery	} 11 ft. high.	{	<i>l</i> , Stairs
<i>i</i> , Store-Room			<i>m, m</i> , Bed Rooms
<i>K</i> , Kitchen			<i>n</i> , Dressing-Room
<i>k, k</i> , Closets			<i>o</i> , Stair-Cafe

The Chamber Floor consists of two Bed Rooms, and Dressing-Room over *b*, 13 ft. high. The upper Rooms in the Wings are Lodgings for Servants.—The Cellar Floor runs under the whole Building for all the rest of the requisite Conveniences, Servants Hall, Pantries, &c. and communicates with each Stair-Cafe, *l, o*, 9 ft. 6 In. high.

N. B. Over *d* and *g* a covering of Lead.

## PL. XXXI.

A Plan and Elevation of a Building for a Gentleman in the Country, consisting of the following Rooms.

<i>a</i> , Hall	} 13 ft. high.	{	<i>d</i> , Dining-Room
<i>b, b</i> , Parlours			<i>e</i> , Stair-Cafe
<i>c</i> , Drawing-Room			<i>f</i> , Little Stair-Cafe
<i>g</i> , Passage to Kitchen	} 11 ft. high.	{	<i>l, l</i> , Two Sheds for Kitchen Uses
<i>h</i> , Scullery			<i>n</i> , Passage
<i>i, i</i> , Pantries			<i>o</i> , Closet
<i>k</i> , Store-Room			<i>p, p</i> , Coach-House
<i>K</i> , Kitchen			<i>q, q</i> , Stables
<i>l</i> , Larder			

The Chamber Story consists of four Bed Rooms, and Dressing-Room over *b* 15, 12 ft. high. The Garret Floor has two large Rooms over *a* and *d* : the rest on each side



side lighted from the Roof with Sky-Lights. There are also Rooms over the Kitchen, &c. for Servants. The Roofs to *g*, *17*, and *l*, *l*, *l*, are conceal'd, the Garden-Wall being carry'd the same height as the Walls over the two Doors. The Cellar Story 8 *ft.* 6 *In.* high, with the going to under the Stairs *f*.  
 N. B. The Court next *o* may be cover'd with *n* and *o*.

PL. XXXII. A Design of a Building for a Gentleman of Family and Fortune in the Country, to be erected on a pleasant and healthy Spot. The Rooms are distributed as follows.

<i>a</i> , Hall	} 14 <i>ft.</i> high.	{ <i>d</i> , <i>d</i> , Parlours <i>e</i> , Elliptical Dining-Room <i>f</i> , Withdrawing-Room
<i>b</i> , Breakfasting-Room		
<i>c</i> , <i>c</i> , Best and back Stairs		
<i>g</i> and <i>i</i> , Colonades and Passage to Library Kitchen and Store-Room		
<i>b</i> , Library	} 20 <i>ft.</i> high to the Roof.	
<i>K</i> , Kitchen		
<i>k</i> , Small Stairs to Cellars	} Lean-to's conceal'd below the Walls	
<i>l</i> , <i>l</i> , Closets		
<i>m</i> , Butler's Pantry		
<i>n</i> , Scullery		
<i>o</i> , Store-Room		
<i>p</i> , Larder		
<i>q</i> , <i>q</i> , Courts		

The Chamber Floor consists of Bed Rooms over *a*, *d*, *e*, *f*: Dressing-Room over *d* 18, and Closet over *b*, 13 *ft.* high. The Garret Floor has the same number of Rooms over each, and one over the best Stair-Cafe, 9 *ft.* high. The Cellar Story 8 *ft.* 6 *In.* high, for Servant's Hall, &c. &c.

PL. XXXIII. Is another Design for a Gentleman in the Country. The Distribution of the Apartments as under.

<i>a</i> , Hall	} 14 <i>ft.</i> high.	{ <i>g</i> , Library or Study <i>h</i> , Dressing-Room <i>i</i> , Stair-Cafe <i>k</i> , Passage to <i>K</i> , Kitchen <i>l</i> , Store-Room
<i>b</i> , <i>b</i> , Parlours		
<i>c</i> , Dining-Room		
<i>d</i> , Withdrawing-Room		
<i>e</i> , Stair-Cafe		
<i>f</i> , <i>f</i> , Communication to the Wings		
<i>m</i> , Stairs	} 11 <i>ft.</i> high.	{ <i>q</i> , Closet <i>r</i> , Stable <i>f</i> , <i>f</i> , Coach-Houses <i>i</i> , Stair-Cafe
<i>n</i> , Scullery		
<i>o</i> , Servant's Hall		
<i>p</i> , <i>p</i> , Pantry and Closet		

The Chamber Floor consists of four Rooms over *b*, *b*, *c*, *d*: Dressing-Room and Closet over *a*: and a Closet over *h*, in *c*, 13 *ft.* high. Also the same number of Rooms to Garret Floor, 10 *ft.* high.

N. B. Lodging Rooms for Servants over *g* in the Wing and Landry, and Rooms over *K*.

The Cellar Story 8 *ft.* high.

PL. XXXIV. Is a Design of a House with four Fronts, the Area of the Rooms being 50 *ft.* square, to be situated on a rising Spot which commands an extensive and agreeable Prospect from every Front, and is divided as follows.

<i>a</i> , <i>a</i> , Hall, &c.	} 13 <i>ft.</i> high.	{ <i>e</i> , Study <i>f</i> , Stair-Cafe <i>g</i> 's Passages <i>h</i> , Back Stairs <i>i</i> , Closet
<i>b</i> , Saloon, lighted from 8 Windows on Gallery. vid. Section		
<i>c</i> , Dining-Room		
<i>d</i> , <i>d</i> , Parlours		

The

The Chamber Floor consists of 6 Rooms, and a Closet over *i*, being 11 *ft.* 6 *In.* high, with Communications to each Room through *g*'s and to Stair-Cafe leading to the octagon Gallery over the Saloon: no Rooms in the Roof. The Chimnies are carried up in the four Corners of the Ballustrade on the Roof. The Kitchen and other Offices are in the Cellar Story, 9 *ft.* 6 *In.* high.

PL. XXXV. Is a Section to the foregoing Plate.

PL. XXXVI. Is another Design of a House to be placed on an Eminence. [As lofty Halls are often introduced, which generally spoil the Rooms over them, I have given one which has no Connection with the Rooms in the Chamber Story]. (Vide Section) The Distribution as follows.

<i>a</i> , Hall 24 <i>ft.</i> high.		
<i>b</i> , Dining-Room	} 14 <i>ft.</i> high.	<i>f, f</i> Small Parlours
<i>c</i> , Drawing-Room		<i>b</i> , Great Parlour
<i>d</i> , Stair-Cafe		<i>i</i> , Passage
<i>e</i> , Passage		<i>k</i> , Study
		<i>l</i> , Closet

The Chamber Story consists of two large Rooms over *b* and *c*, a Dressing-Room over *f*, *x*, and Bed Rooms over *f*, *b*, *k*: also a Closet over *l*, 13 *ft.* high. The two Stair-Cafes are carry'd up to Garrets 9 *ft.* high, over *b*, *c*, *b*, *k*. The Kitchen or Cellar Story is 11 *ft.* high, being divided into Apartments for the Conveniencies of the Family. The Stables, &c. in this and the last Design, are intended to be in a Bottom at some Distance from the House, that the Prospects may be obstructed as little as possible.

PL. XXXVII. Section to the foregoing Plate.

PL. XXXVIII. A Plan and Elevation of an equilateral Triangular Building, each Side between the Towers being 100 *ft.* long (on the outside) designed to command three Vistas. [Having observ'd in some eminent Authors \*, that this Figure is utterly rejected, as incapable of any tolerable Division within, except into other Triangles, I have here endeavour'd to make some regular Distribution of it. How far I have succeeded in the Attempt, respecting Strength, Utility, and Figure, must be left to the Candid and judicious.] The Rooms are delineated as under.

<i>a</i> , Hall	} 12 <i>ft.</i> high.	<i>f</i> , Study
<i>b, b</i> , Parlours		<i>g</i> , A Water Closet
<i>c</i> , Dining-Parlour		<i>b</i> , Dressing-Room
<i>d</i> , Best Stair-Cafe, illuminated from a triangular Roof of Glais in the Valley		<i>g, g, g</i> , Closets
		<i>i</i> , Back Stairs
		<i>k</i> , Passage to
<i>e</i> , A small Hall or common Entrance		<i>l &amp; m</i> , Housekeeper's Apartments and Store-Room
		<i>n</i> , Butler's Pantry

The rest of the Offices in the Cellar-Plan, 10 *ft.* high.

PL. XXXIX. The principal Floor to the foregoing Plate, consisting of the following Rooms.

<i>a</i> , Dining-Room	} 15 <i>ft.</i> high.	<i>q, q, q</i> , Lodging Rooms
<i>p</i> , Withdrawing Room		<i>r, r</i> , Dressing or Lodging Rooms
<i>q x</i> , Best Bed Room		
<i>r x</i> , Dressing-Room to ditto		<i>f, f, f</i> , Closets

\* See *Ware's* compleat Body of Architecture, P. 303, *Chambers'* and other Dictionaries.



## AN EXPLANATION to each PLATE. 29

In the Attic Story are the same number of Rooms; and if *a, p, q,* are judged too large, they may be divided into two each, 10 *ft.* high. There are also Garrets in the Roof, the Floor of which lies lower than the Cornice, that the Windows may be conceal'd below the Parapet. Passages taken out, and Lights next to the Valley, for Communications to each Room. Chimneys to be carry'd up through the middle of the Roofs to Towers.

**PLATE XL.** Is a Plan of the principal Floor of a Building adapted for a Person of Quality. The Rooms are divided as follows.

	<i>a,</i>	Hall 40 <i>ft.</i> cube		
<i>b,</i>	Saloon	} 20 <i>ft.</i> high.	<i>g,</i>	Dining-Room
<i>c, c,</i>	Withdrawing Rooms		<i>b,</i>	A small Ante-Room, or if
<i>d,</i>	State-Bed Room			there be a Partition as
<i>e,</i>	Dressing-Room			dotted, a Dressing-Room
<i>f,</i>	Bed Room		<i>i,</i>	Stair-Cafe
			<i>k,</i>	Best Stair-Cafe

The Chamber or Attic Story is divided into a number of Lodging Rooms; that over *b* divided as dotted; no Garrets over *a,* nor in the Roof, but Rooms to be provided in the Wings or additional Apartments. The Basement Story to be 11 *ft.* high, and is laid out as follows. Under *a* is a Hall and a Passage that leads to each Stair-Cafe: *b* Library: *c, c,* Parlours: *d,* Dining-Parlour: *e* and *k,* Housekeeper's Store-Room and Apartment: *f* is a Room for upper Servants: *g,* Steward's Accompting-Room: *h,* Butler's Room: A Passage to be taken out of *g* into the Kitchen-Wing. The Cellar under them to be vaulted.

**PL. XLI.** Elevation to the foregoing Plan.

**PL XLII.** Is a Design for a small Banqueting-Room 15 *ft.* high at the Termination of a Walk, with three small Roofs no higher than the Top of the Parapet; or it may be cover'd with Lead, if this be not thought too expensive.

**PL. XLIII.** Is a Plan for a Banqueting-Room at the end of a Walk, whence you have the command of some extensive and pleasing Prospects.

*a,* Semicircular Portico

*b, c,* Side-Boards

*d,* A Landing and Stair-Cafe into the lower Story, which may be divided into Apartments for requisite Uses, as a Kitchen, &c.

**PL. XLIV.** Elevation and Section to the foregoing Plan: The Room is design'd to be 20 *ft.* high

**PL XLV.** Is a Design for a Person of Quality, of an octangular Church, being 45 *ft.* internal Diameter, to be placed on an Eminence at a small Distance from the Mansion, for the use of his Family, and a Parish that has but few Inhabitants; to be finish'd with a Cove-Cieling 30 *ft.* high.

**PL. XLVI.** Is a Design of an octangular Church or Chapel, 75 *ft.* the internal Diameter.

*a,* Two Stair-Cases leading to the Galleries, which are supported with the eight Columns that support the octagon Doom, 55 *ft.* high.

*b, b,* Vestries

*c,* Communion-Table, and no Gallery over it.

N. B. This Design was drawn in the Year 1753, for a Dissenting Congregation in *Norwich*, but was thought too expensive, and was therefore reduced to 60 *ft.* within, having a very plain Outside. It is a very advantageous Structure for Hear-

## An EXPLANATION to each PLATE.

ing, notwithstanding the Objections made to the Figure by Mr. *Morris*, in his Work entitled *Select Architecture*. There may indeed be some Reason to object against his Sketch, wherein the Arches are to be supported with large angular Jambs forming an Isle or Passage round them, which may cause a confused Reverberation of the Voice interrupted by the Piers: But this will not be the case where Columns are introduced.

PL. XLVII. Is another Design for a small Church or Chapel 50 ft. Diameter within, and 32=6 to the Center of the Dome, which is supported by eight Columns.

*a*, The Altar

*b*, The Portico

On the Outside is a Stair-Cafe which leads into the Family Vault under *a*. [Vide Section, with Receptacles for each Coffin.]

PL. XLVIII. The West End and Section to the foregoing Design.

PL. XLIX. Are the Half of two Designs of Small Chimney-Pieces.

PLATE L. Are two ditto.

PLATES LI, LII, LIII, LIV, LV, LVI, LVII, are Chimney-Pieces of various Finishings, with Profiles. There are no Scales to them, because they must be made to the Openings suitable to their respective Rooms.

PL. LVIII. Is the Masonry of the Semicircular Arch.

PL. LIX. Are two Elliptical Arches.

PL. LX. Are three different Apparatuses to try the Strength and Pressures of Arches.

## AS FOLLOWS.

*A* and *B*, Are Blocks for Abutments

*C*'s Are Pieces of Wood or Stone by which the Arches are form'd: the Length of each being the Breadth of the Bridge or Arcade, &c.

*D*'s Are solid Pieces for Piers

*e*'s Are Pieces laid on each other for Foundations

*f*'s Beds of temper'd Clay

*g*'s Are Tin-pans or Wood-Boxes to receive Water

*H*'s Are Pieces of the same Length as the Arch-Stones

The Heights regular

The Lengths *l, l*, no exact Rule for them

*I*'s Are Pieces of Lead

*K*'s Are three chipt out Blocks

## F I N I S.



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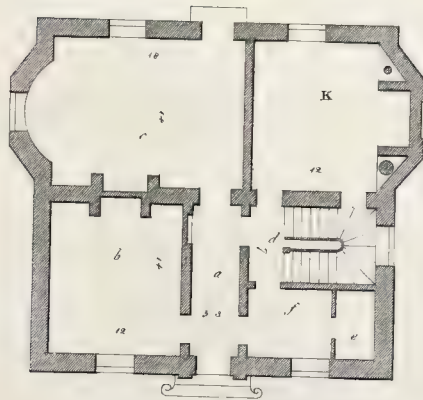
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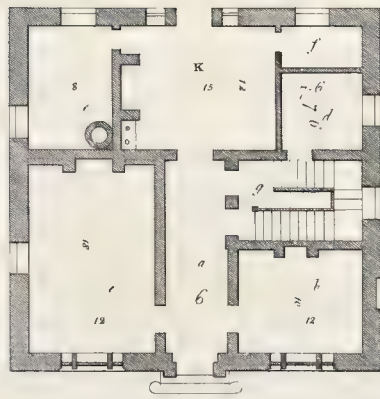
Plate I.



*J. Randel, sculp.*

*J. Miller, sculp.*





*J. Furber sculp.*

*J. Furber sculp.*



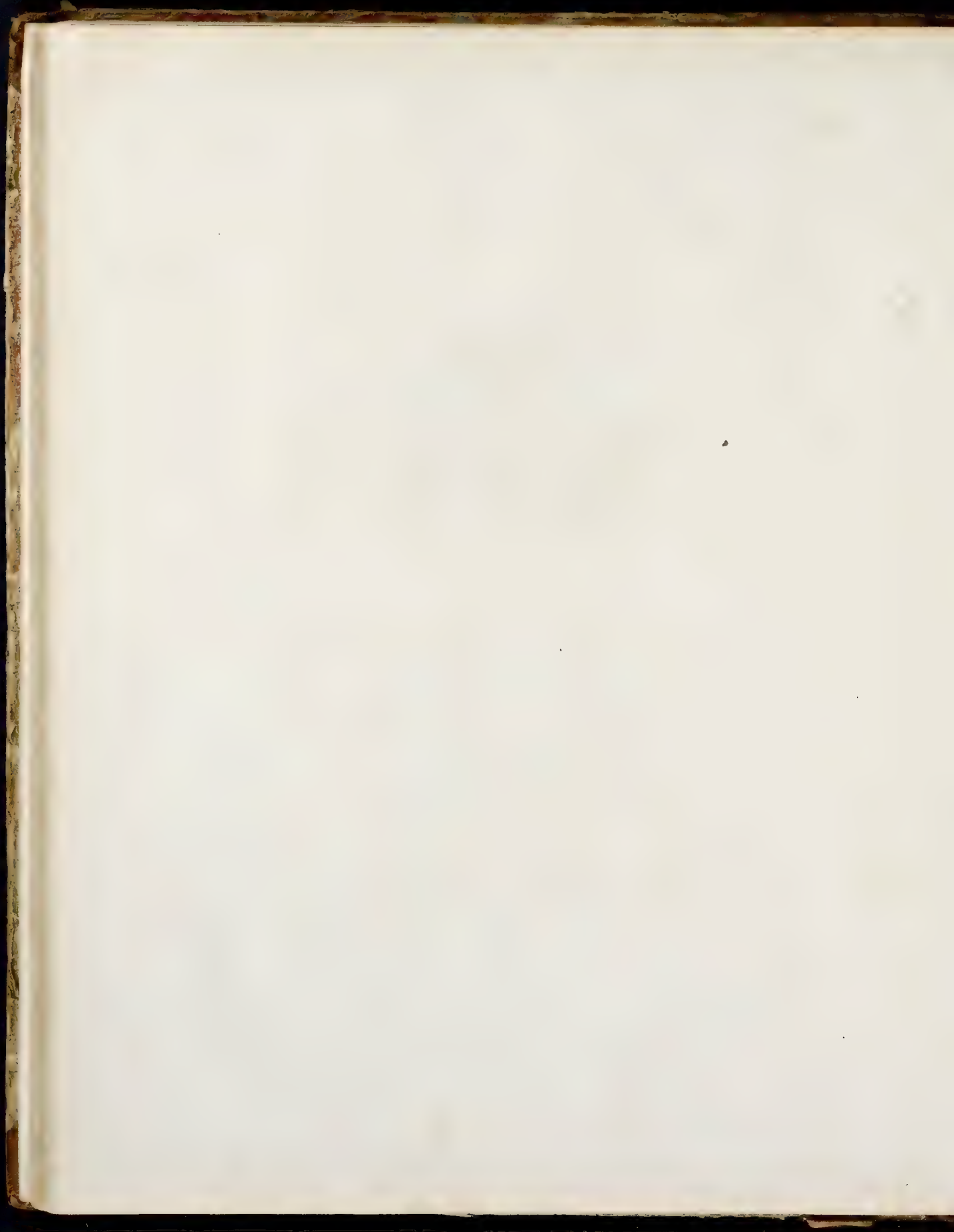
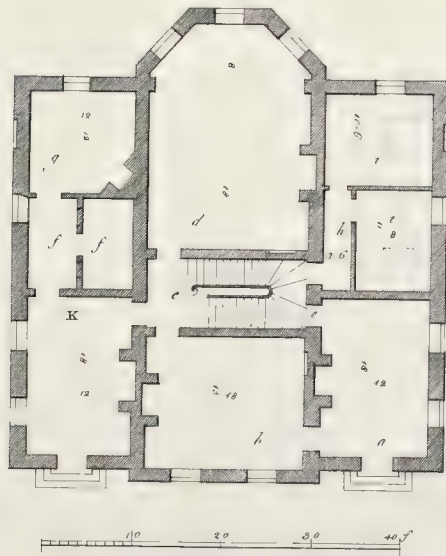
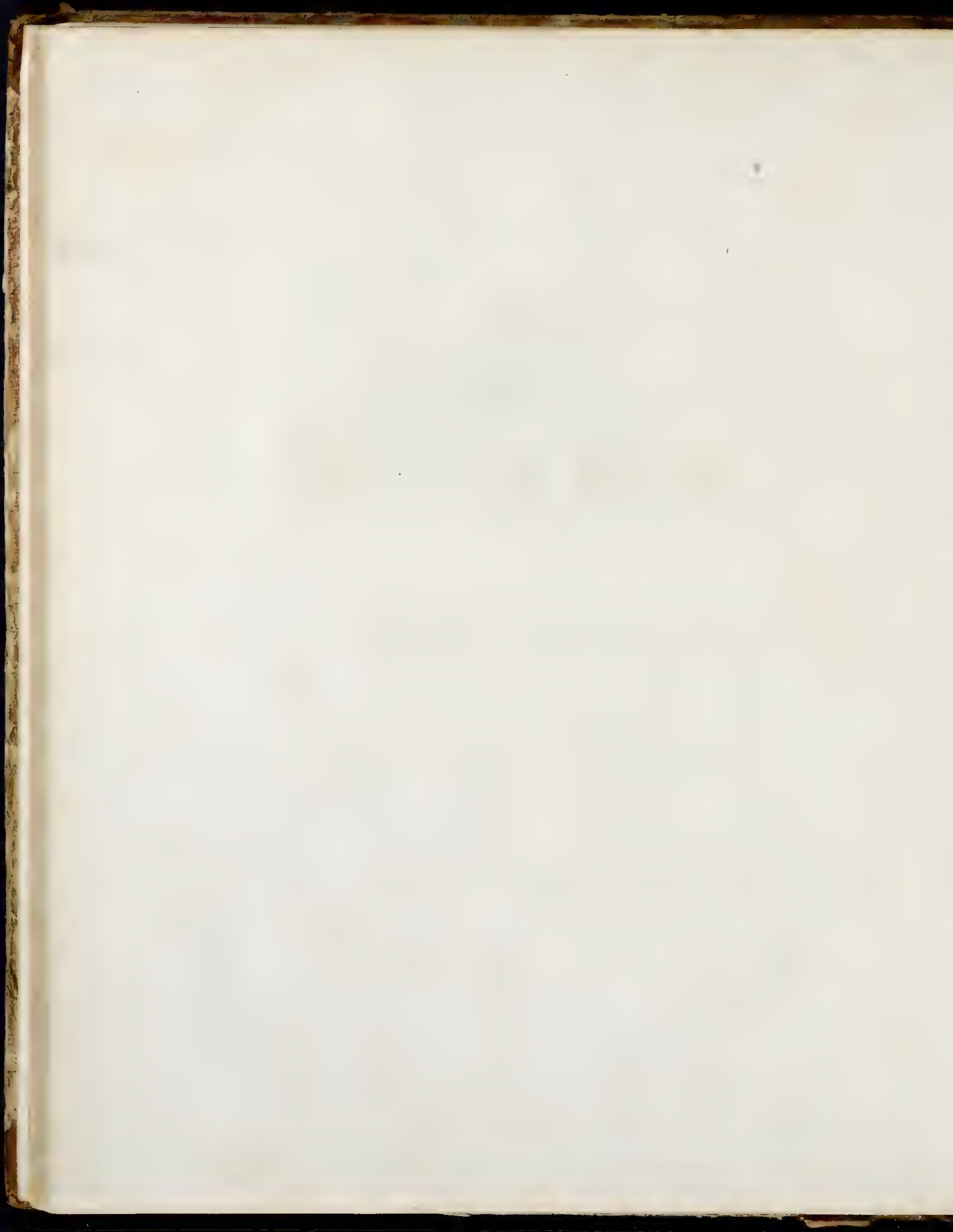


Plate III.



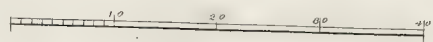
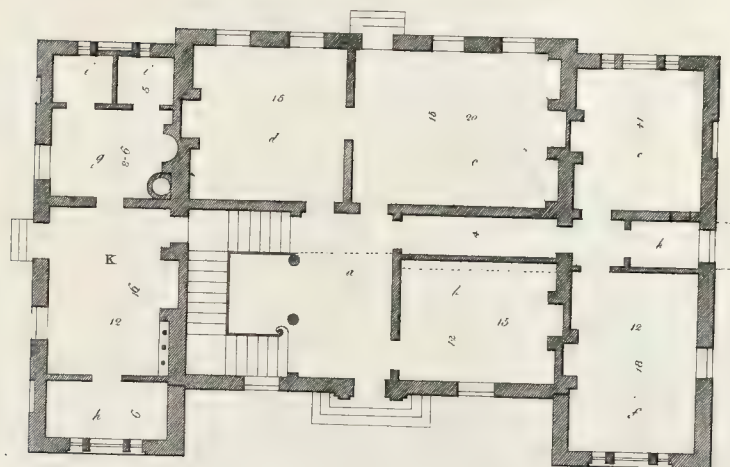
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*J. Miller sc.*



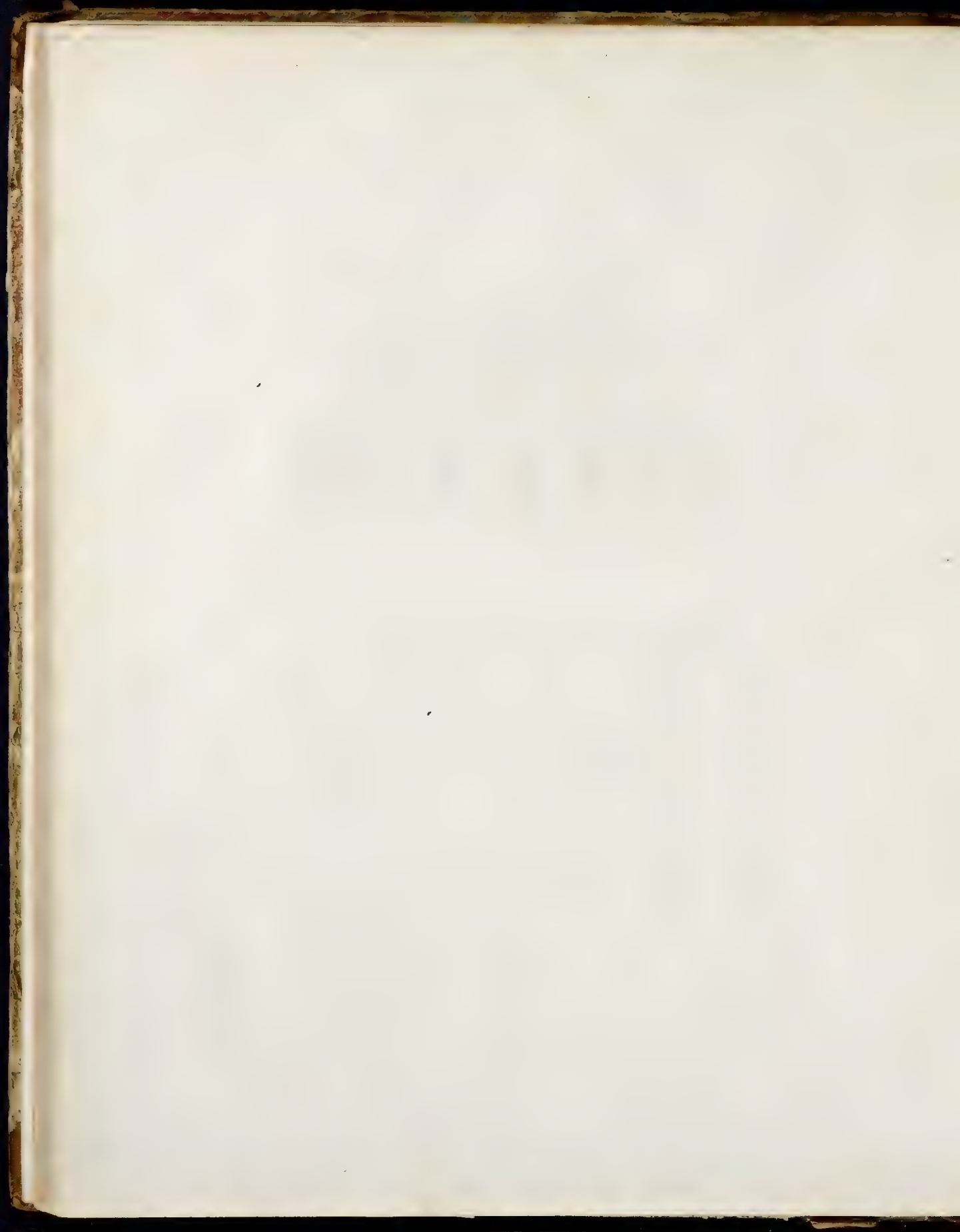


Pl. IV.



*J. Ruelius et del*

*J. Miller sc.*







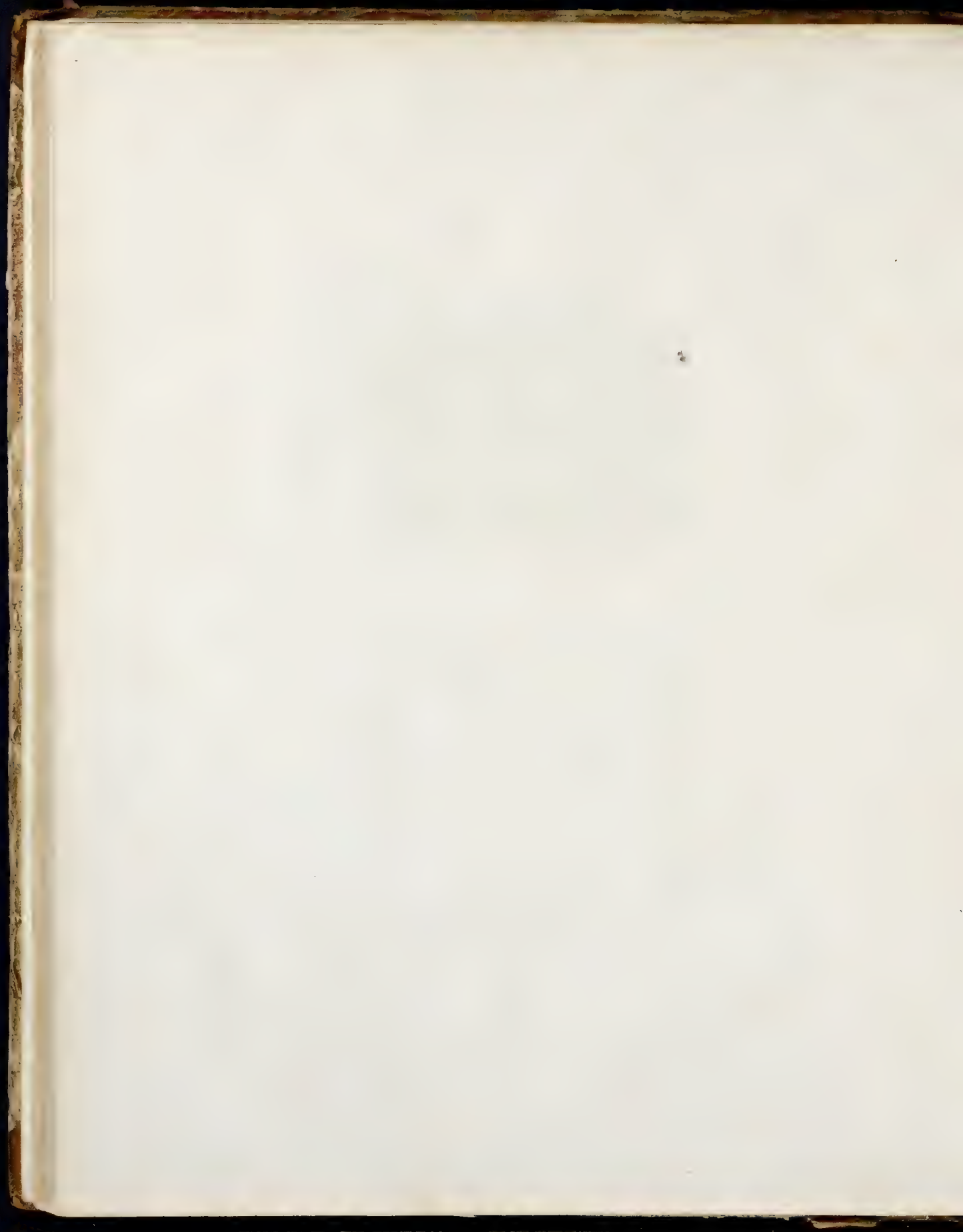
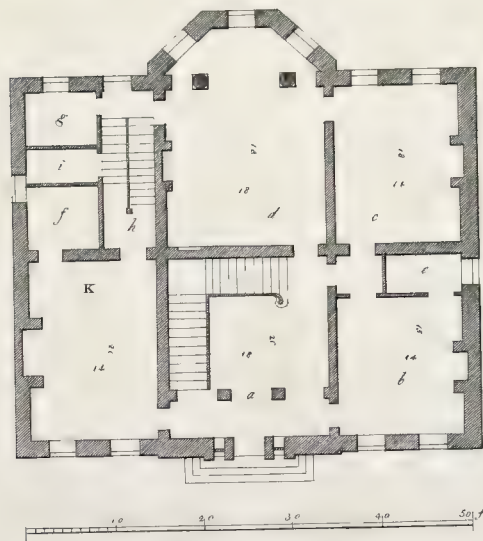
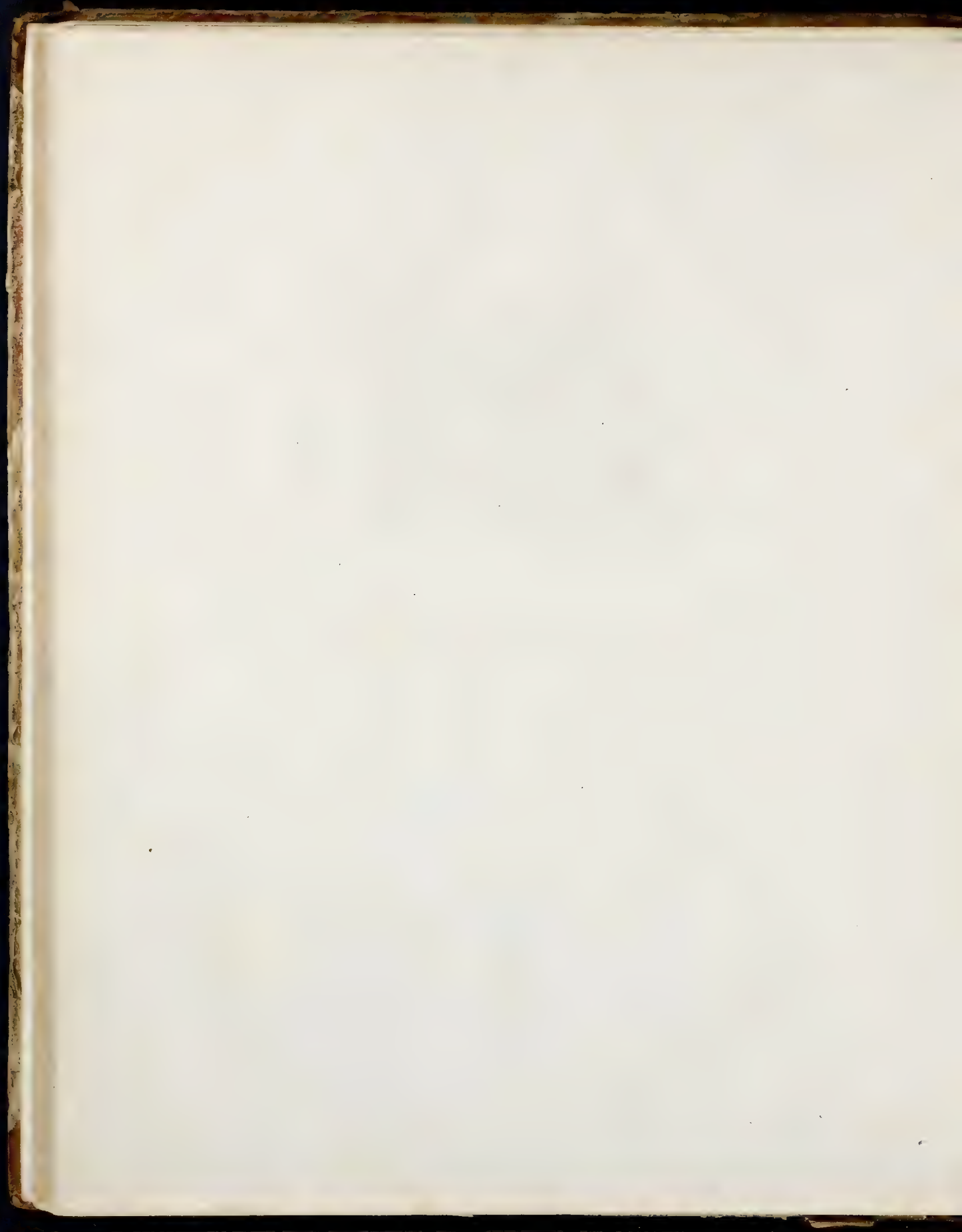


Plate VI.

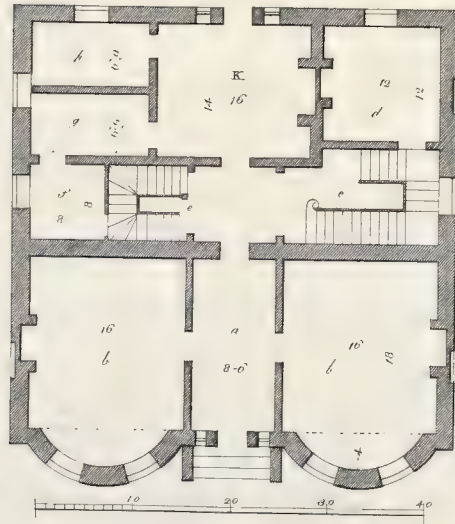


*J. Boulton sculp.*

*J. Miller sculp.*

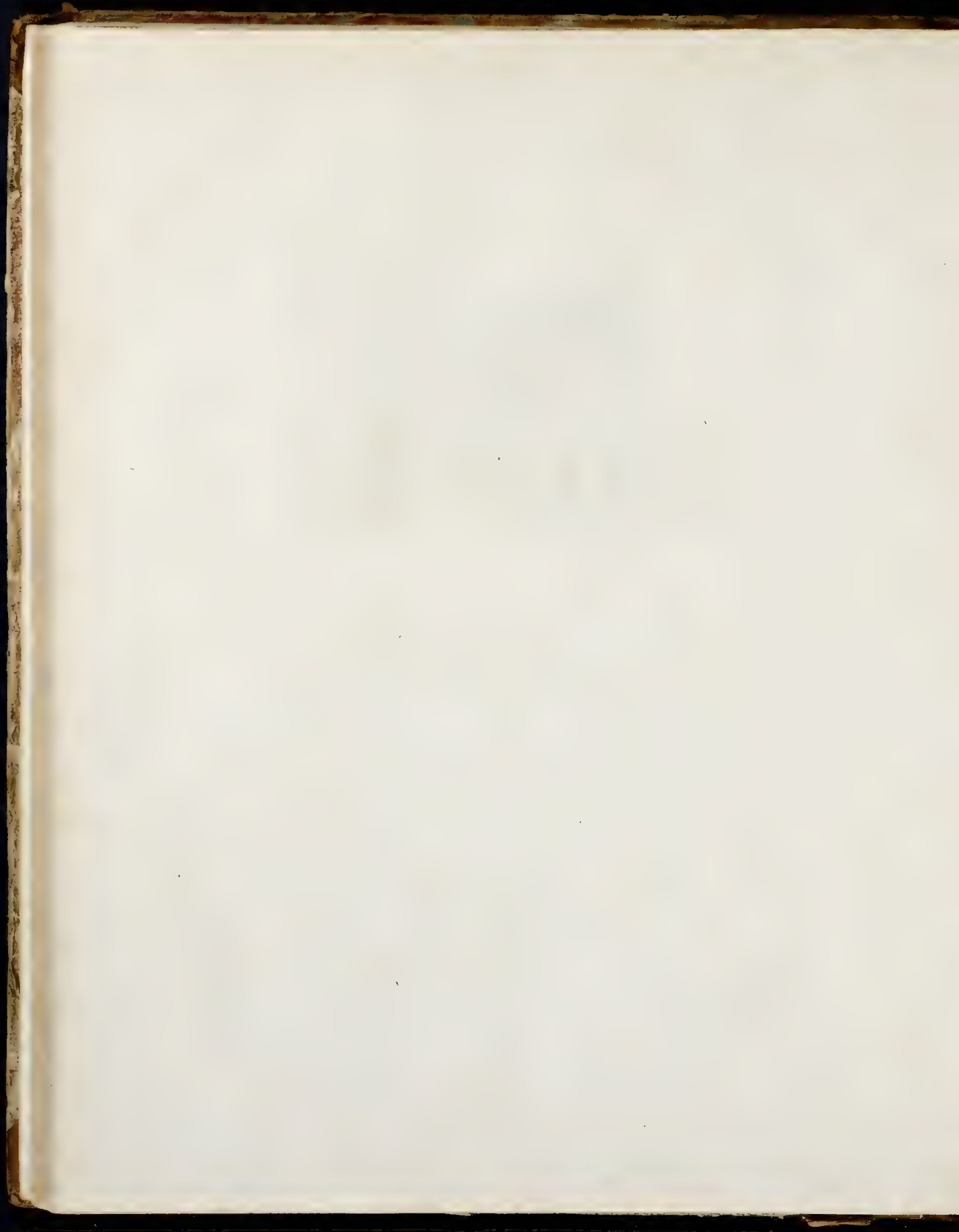






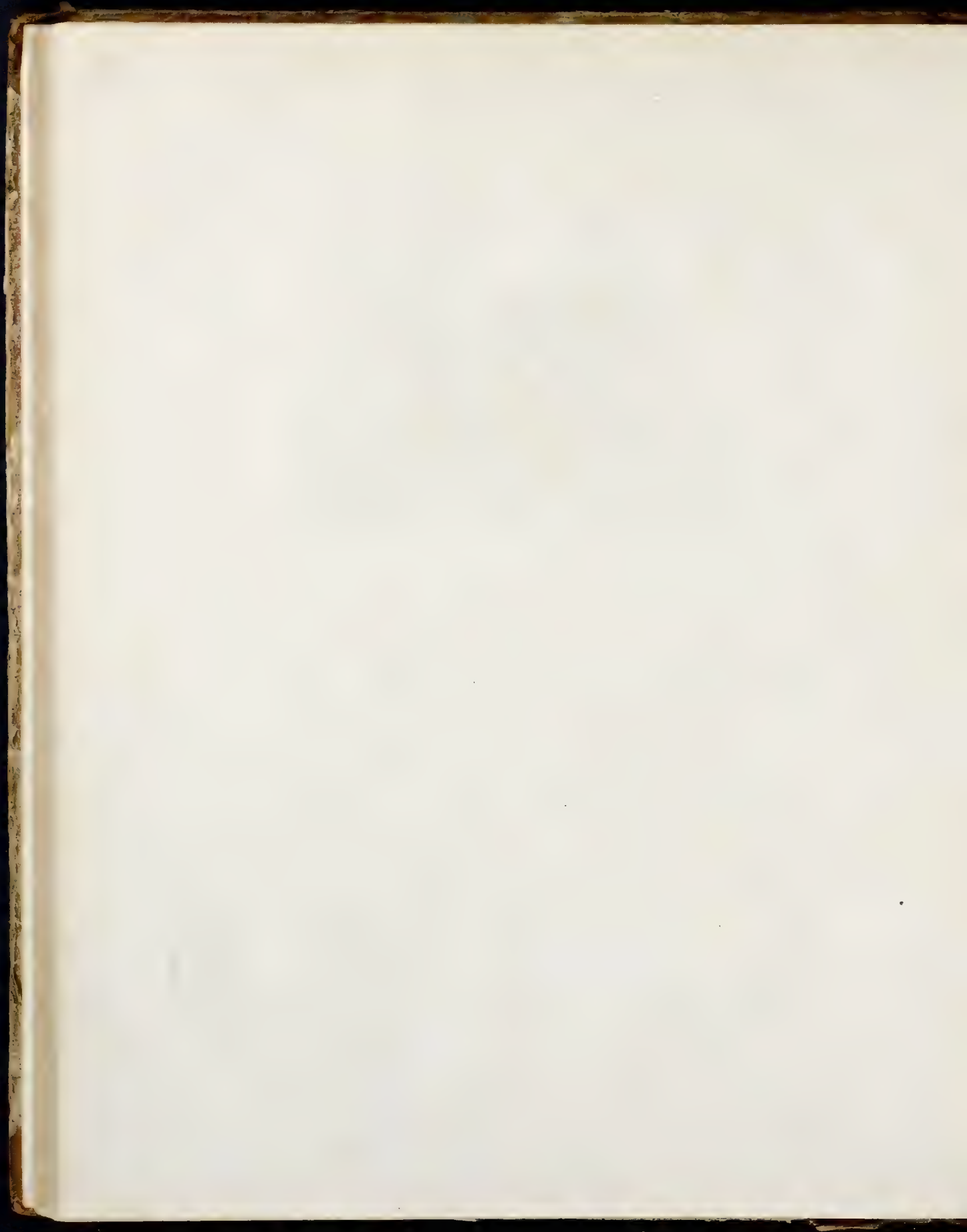
J. Bachmann et del.

J. A. Miller sc.









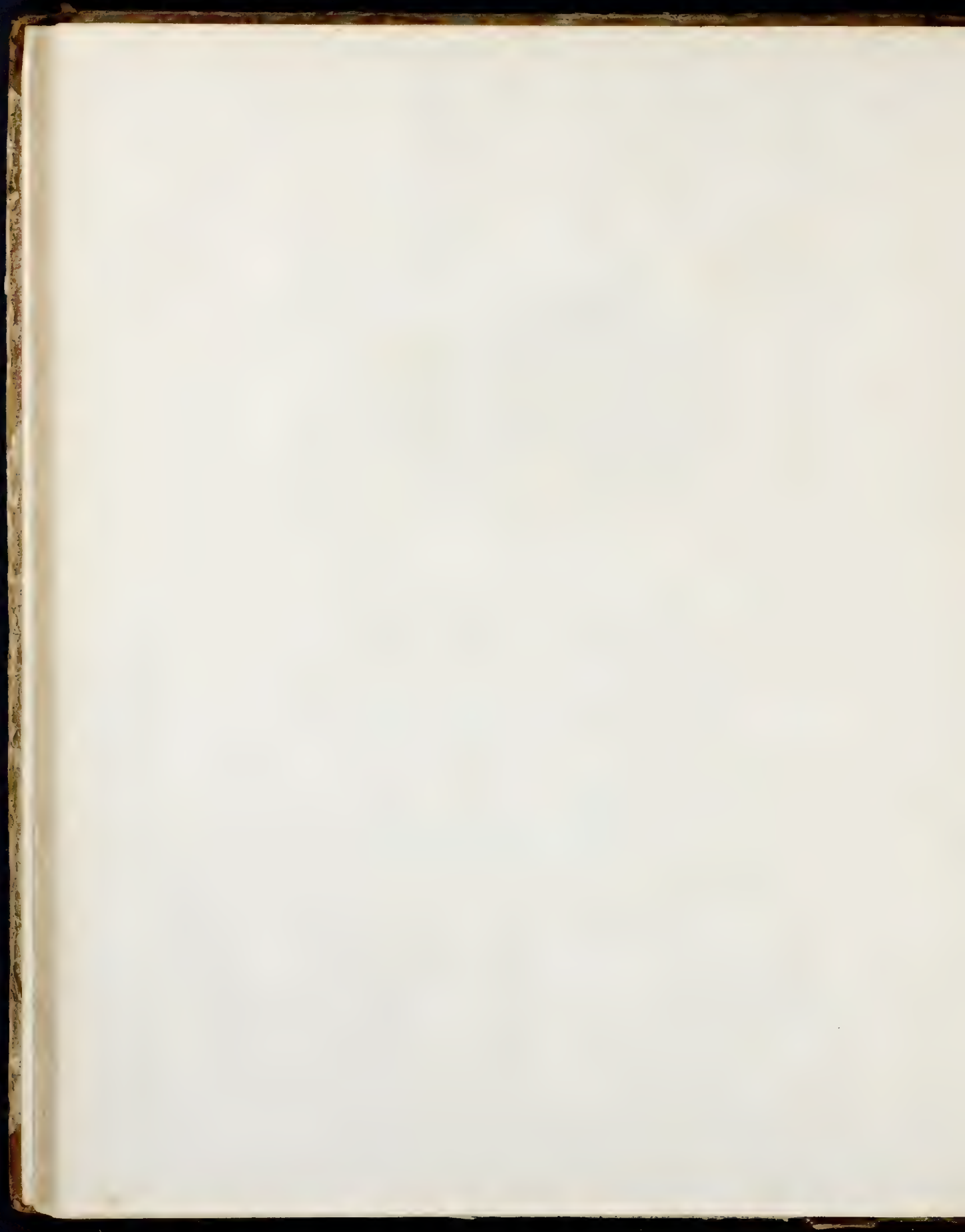
PL. IX.



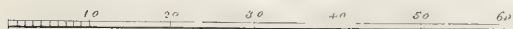
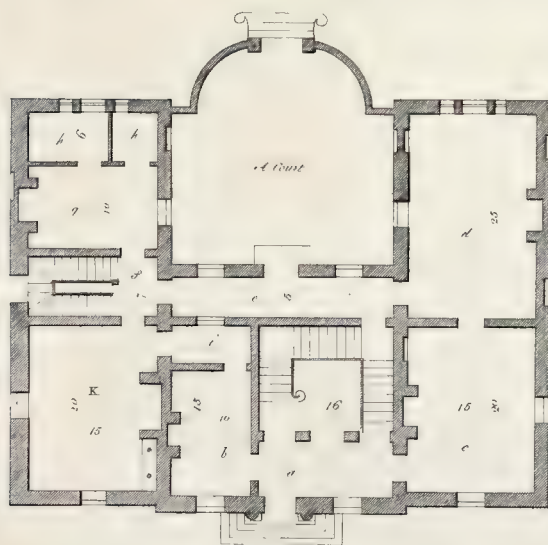
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J. Paulus inv. et del.

J. Miller sc.

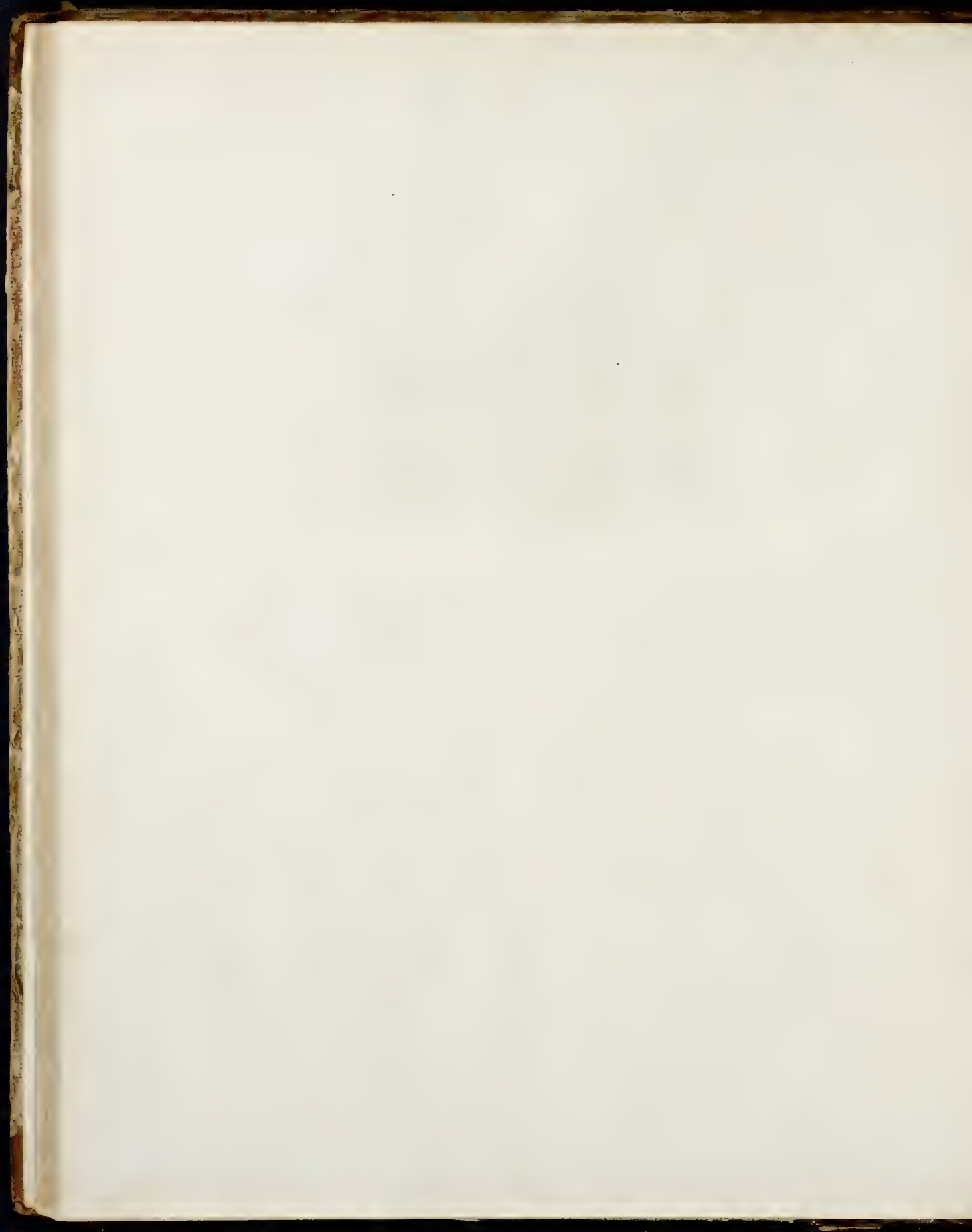


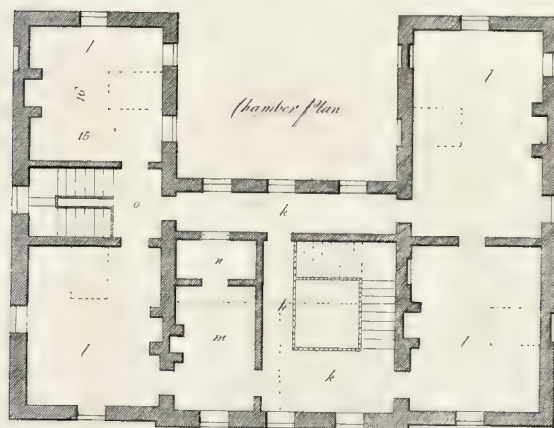




J. W. L. & Co.

J. W. L. & Co.



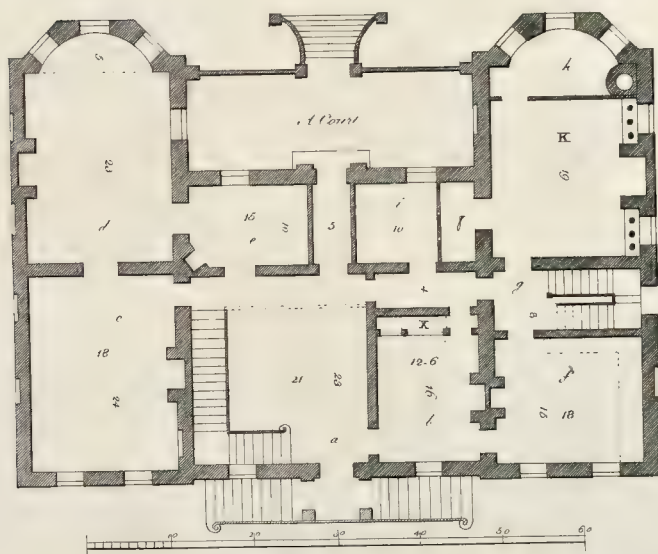


J. Rawlinson del

J. P. M. sculp





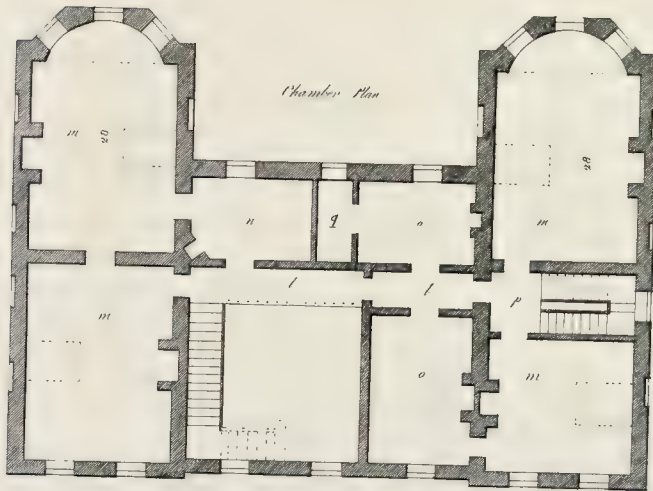


J. Robinson sculp.

J. H. Miller sc.

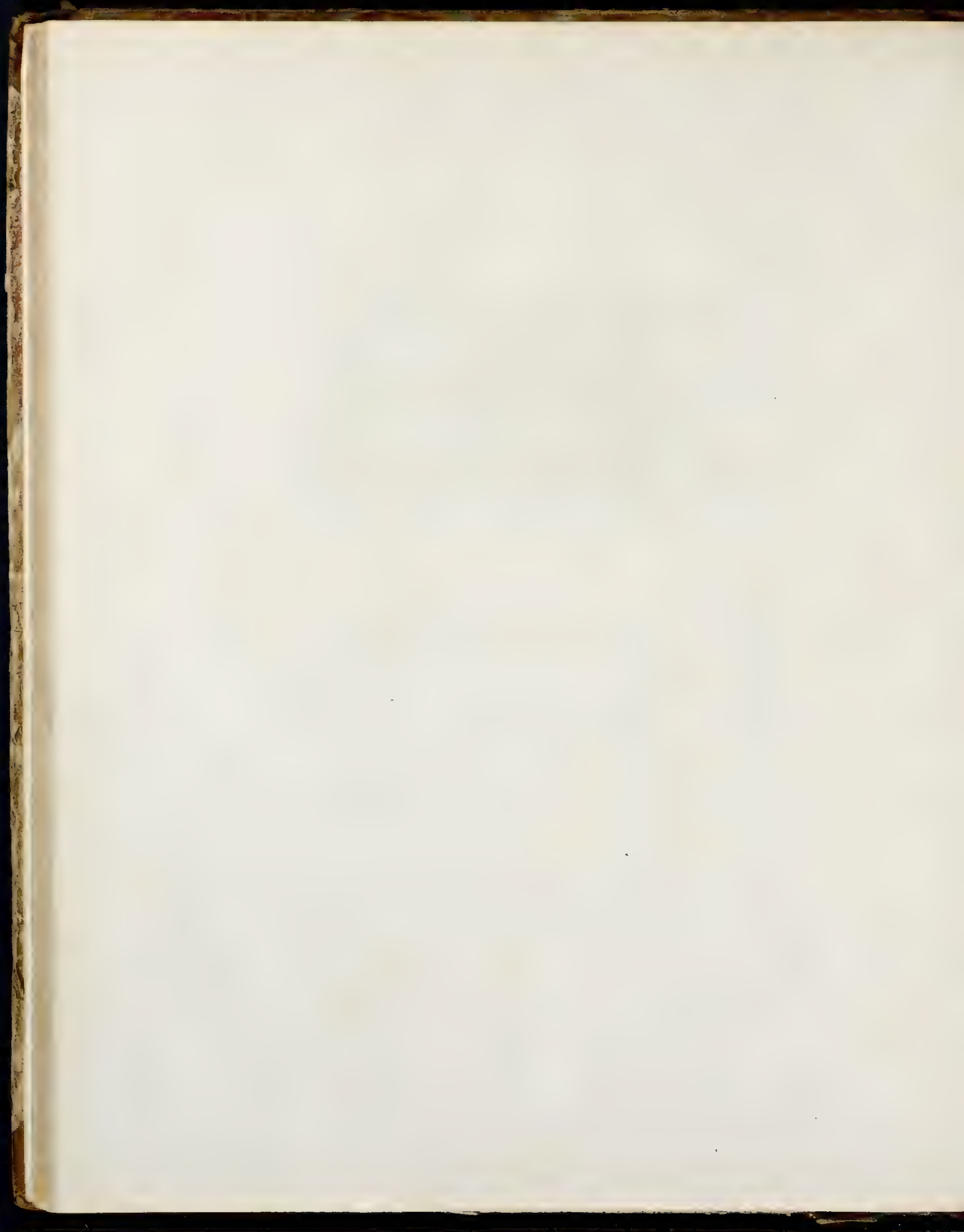


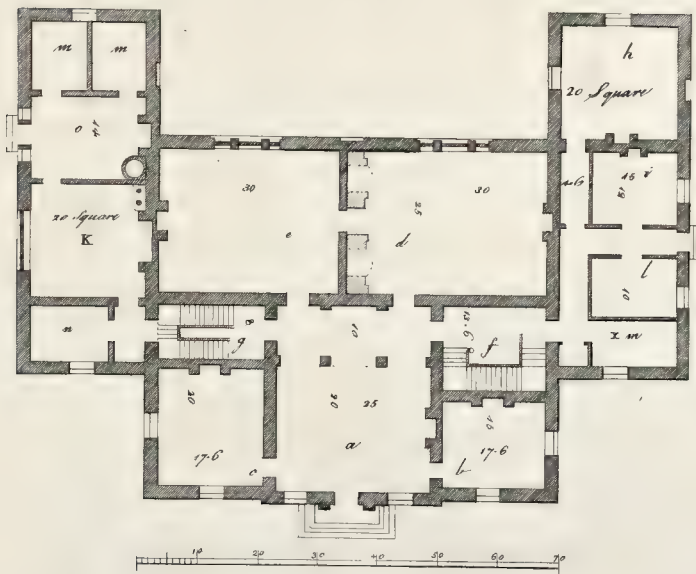




*L. Boulton sculp.*

*J. H. P. del.*

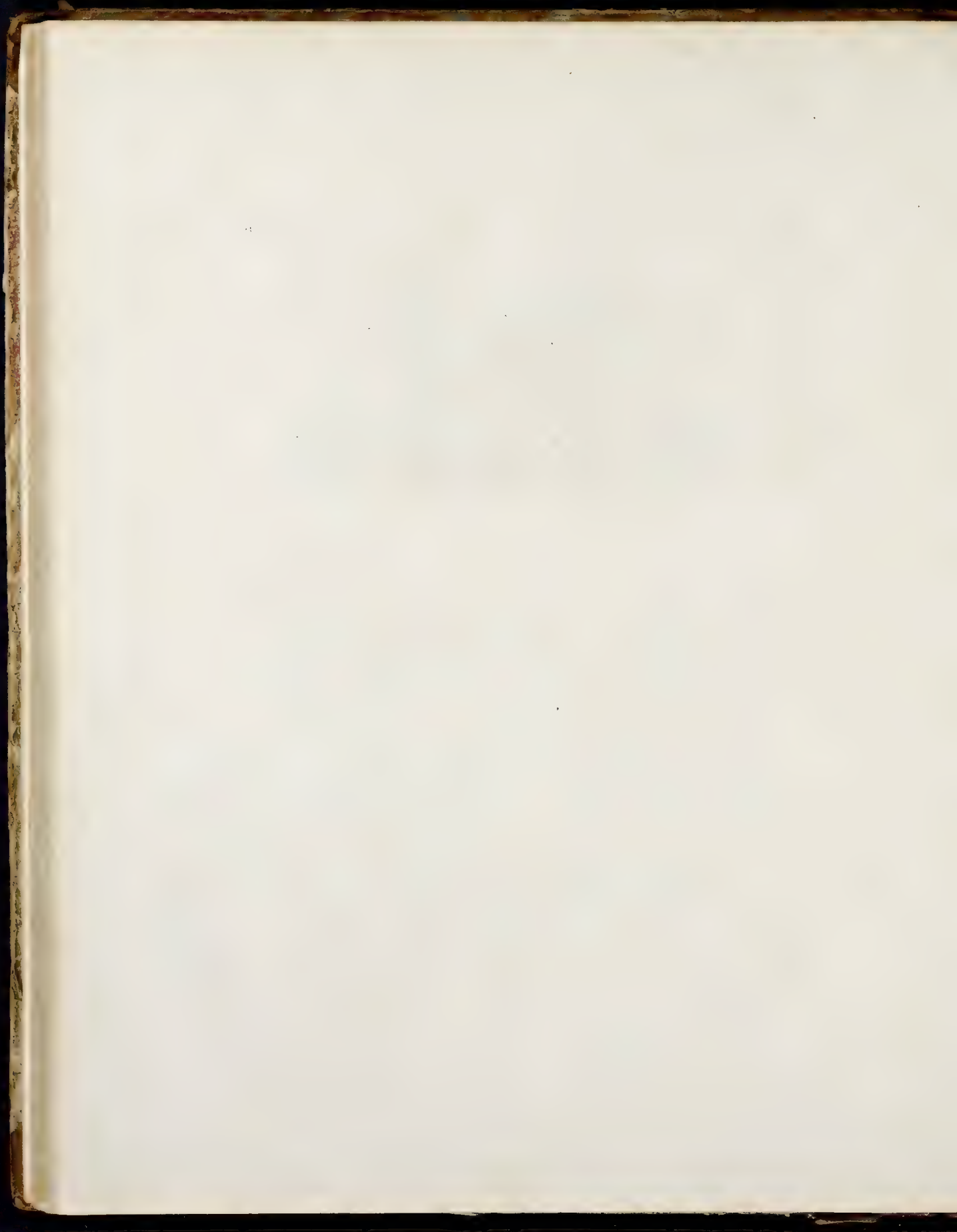




*Revdens m. et del.*

*J. Muller sculp.*

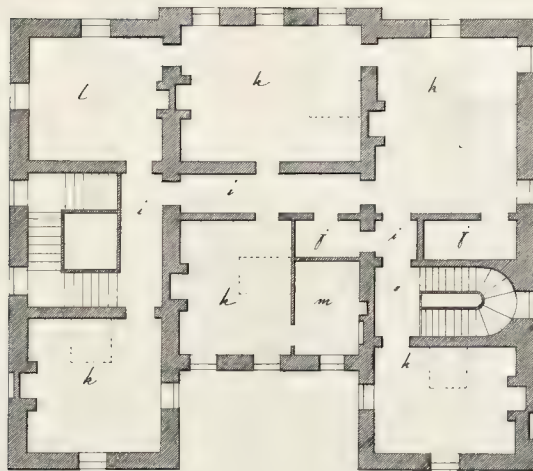








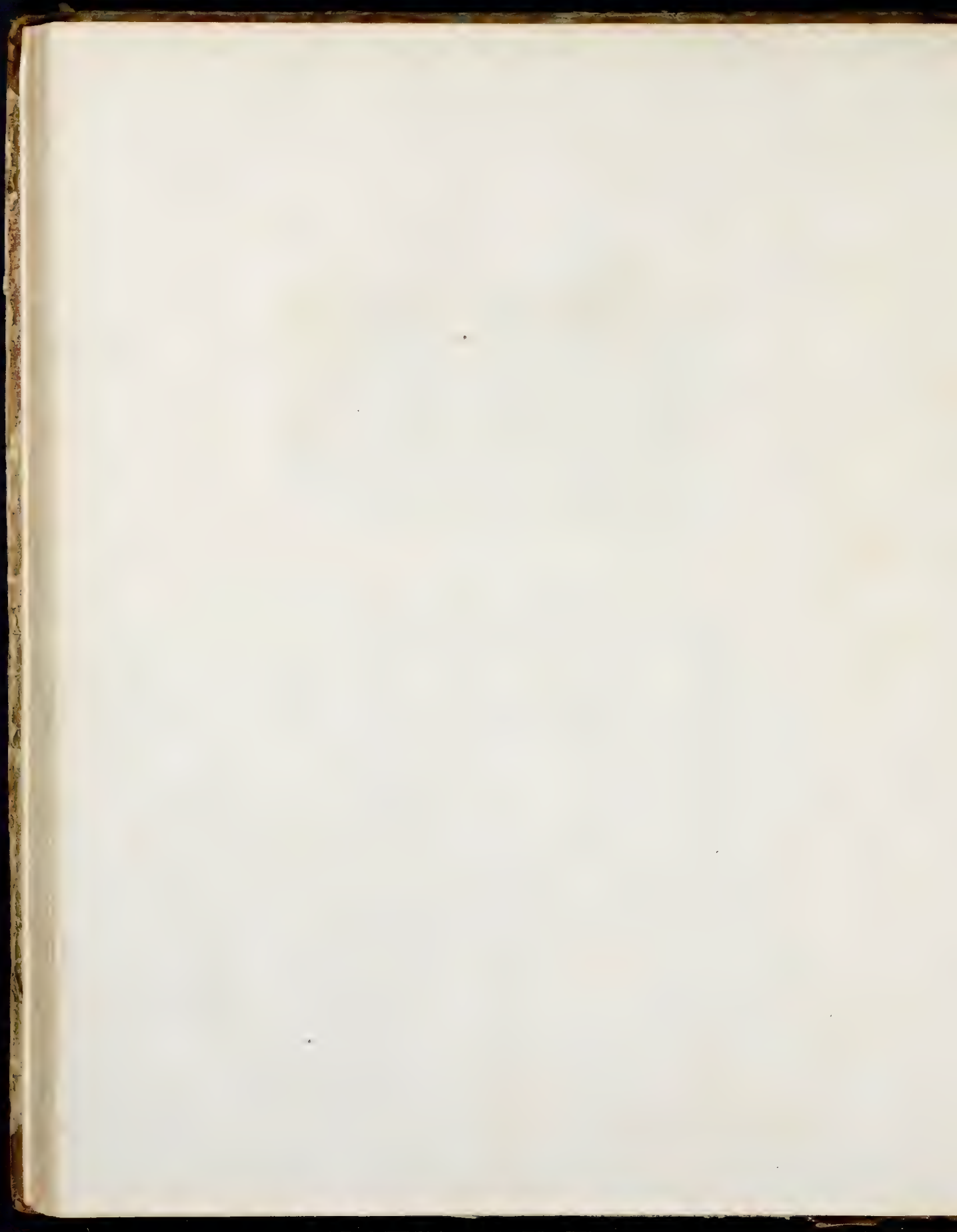




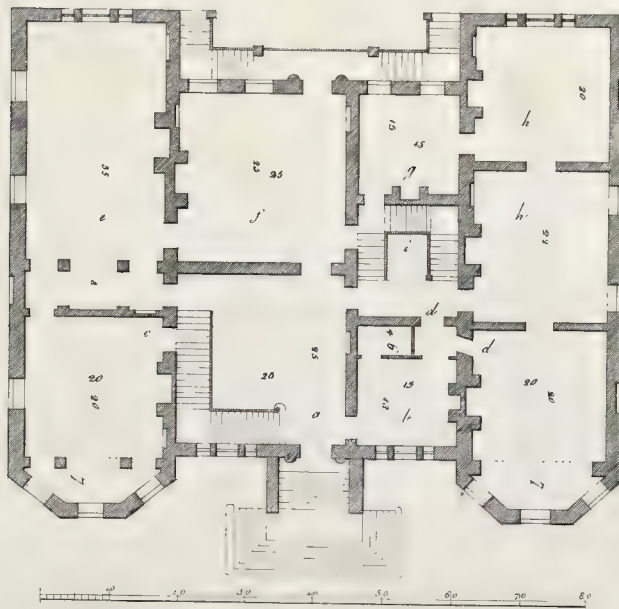
Plan of the Chamber House.

J. R. Anderson del.

T. Miller sculp.



Pl. XVII.

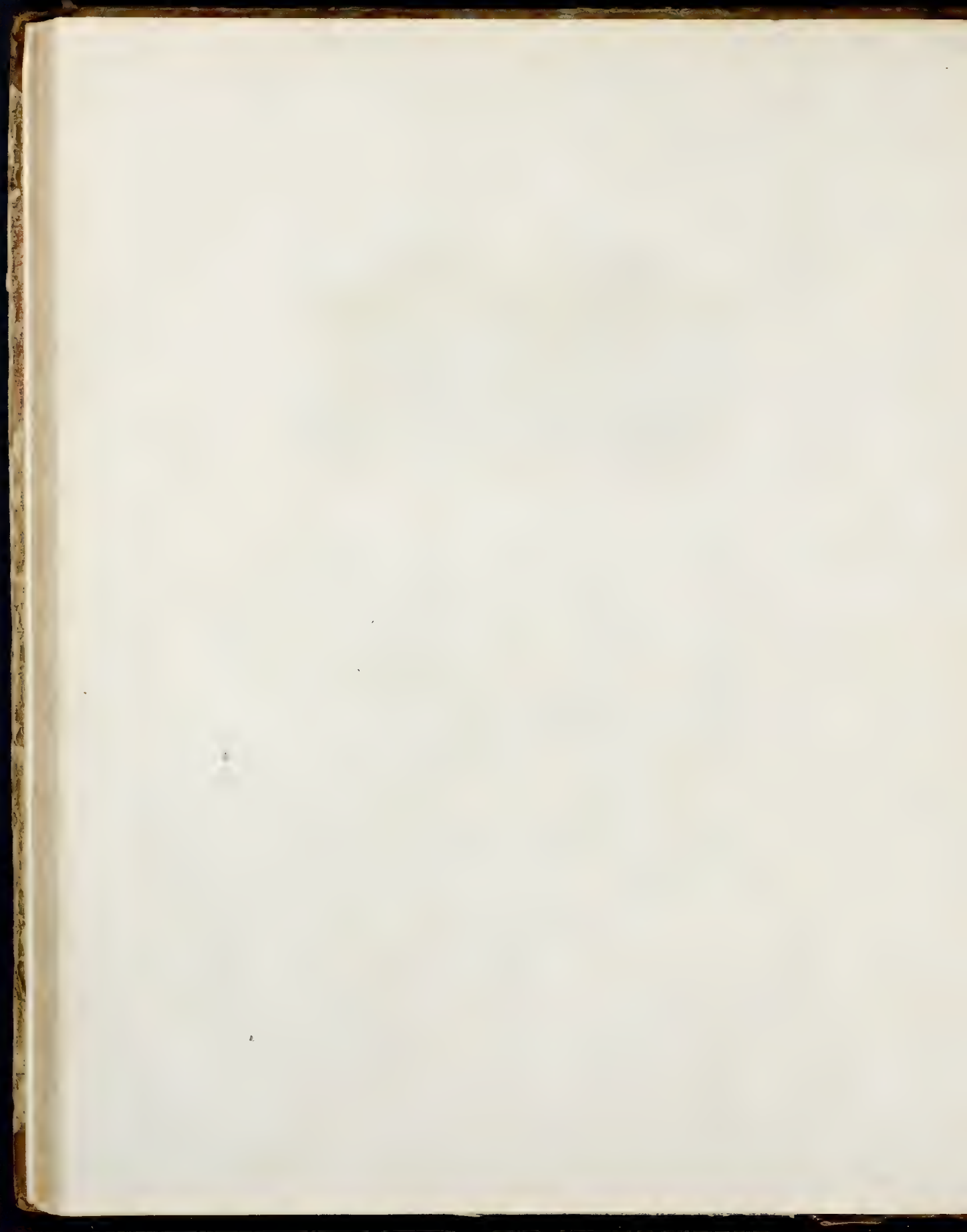


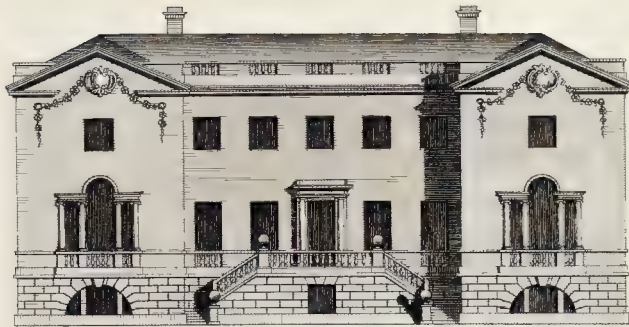
J. Sanderson del.

Plan of the principal floor

J. Sanderson sculp.

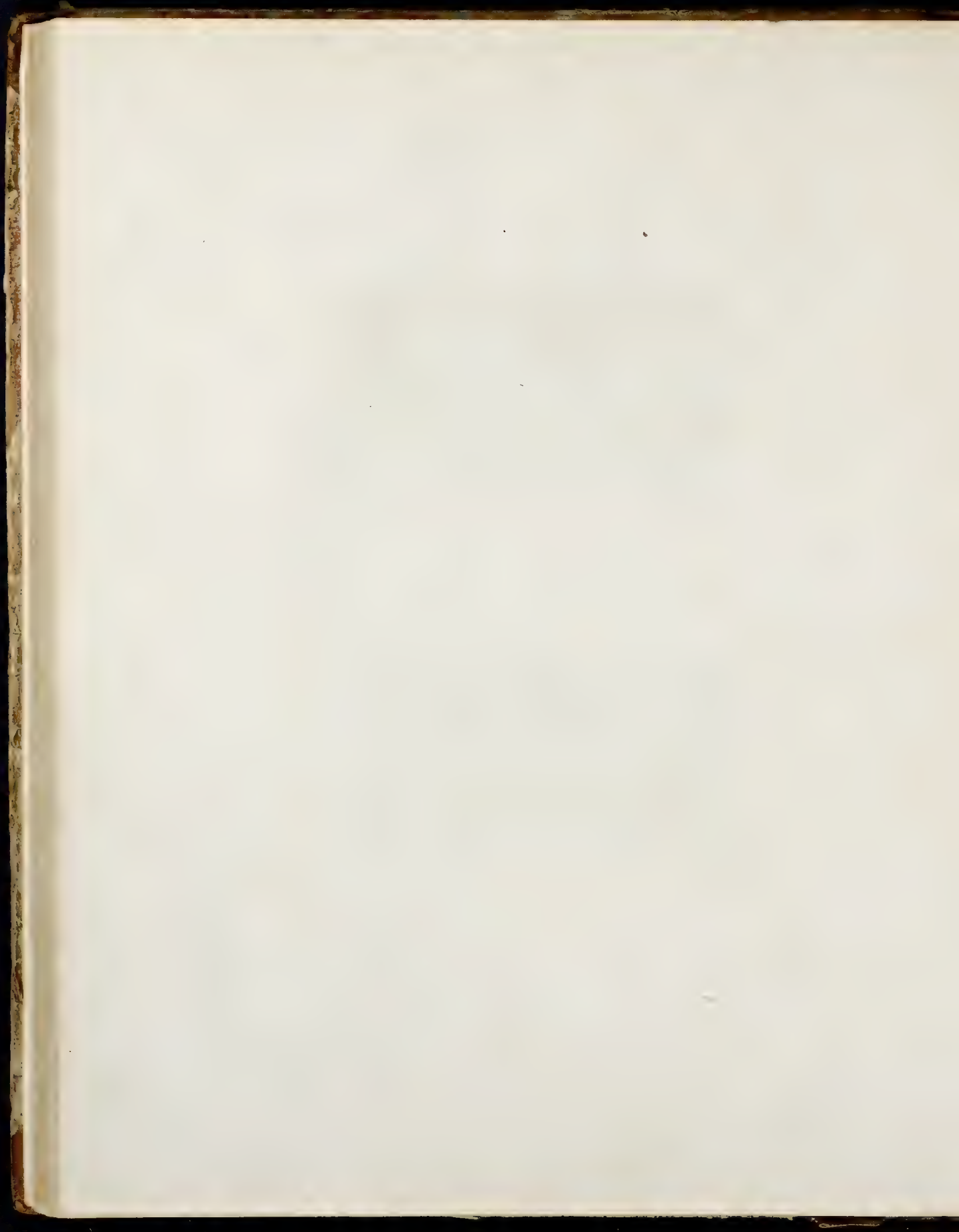




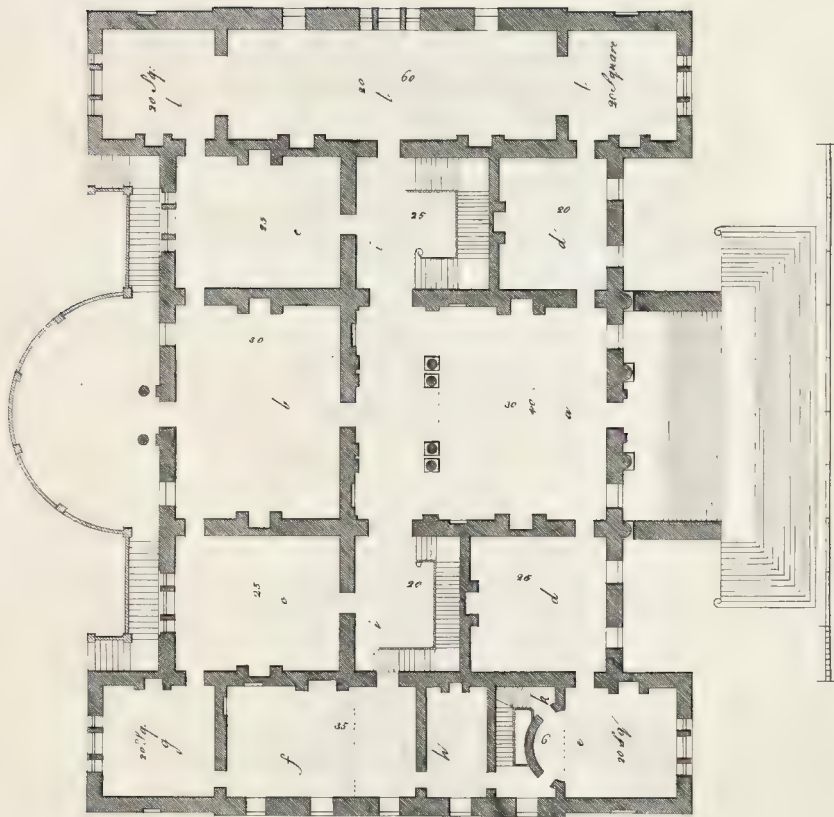


*J. H. Anderson inv. et del.*

*J. H. Miller sculp.*

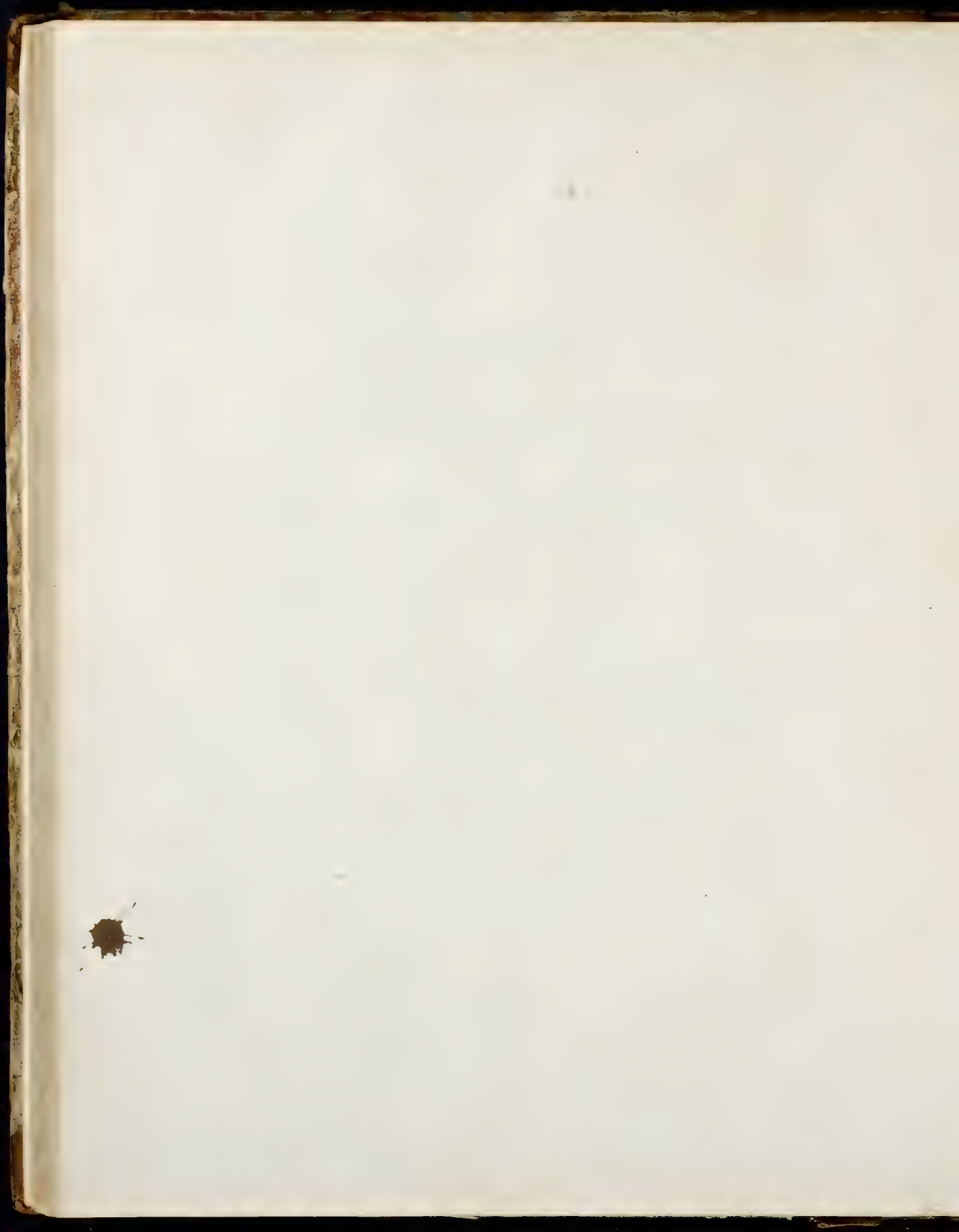






T. Randers Inv<sup>t</sup>

T. M. V. J. J.



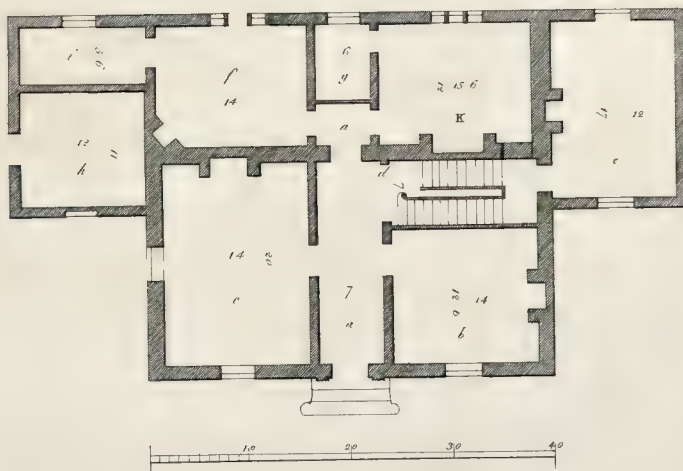


*V. Rinaldi inv. et del.*

*V. M. J. sculp.*





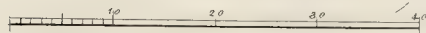
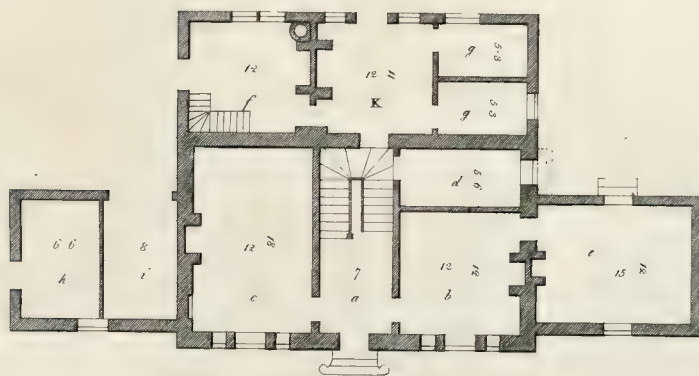


*J. R. Anderson inv. & del.*

*J. M. Wilson sculp.*

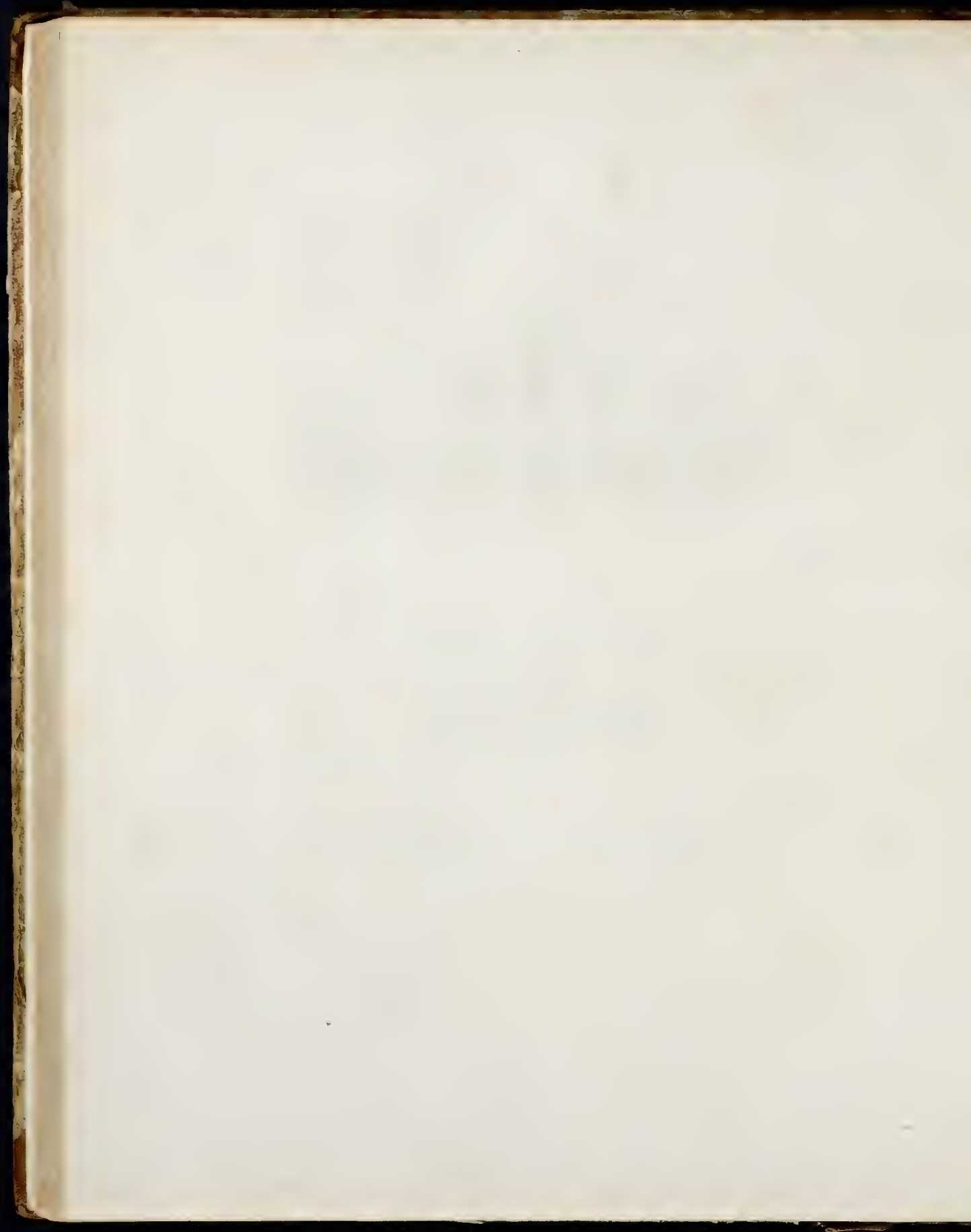






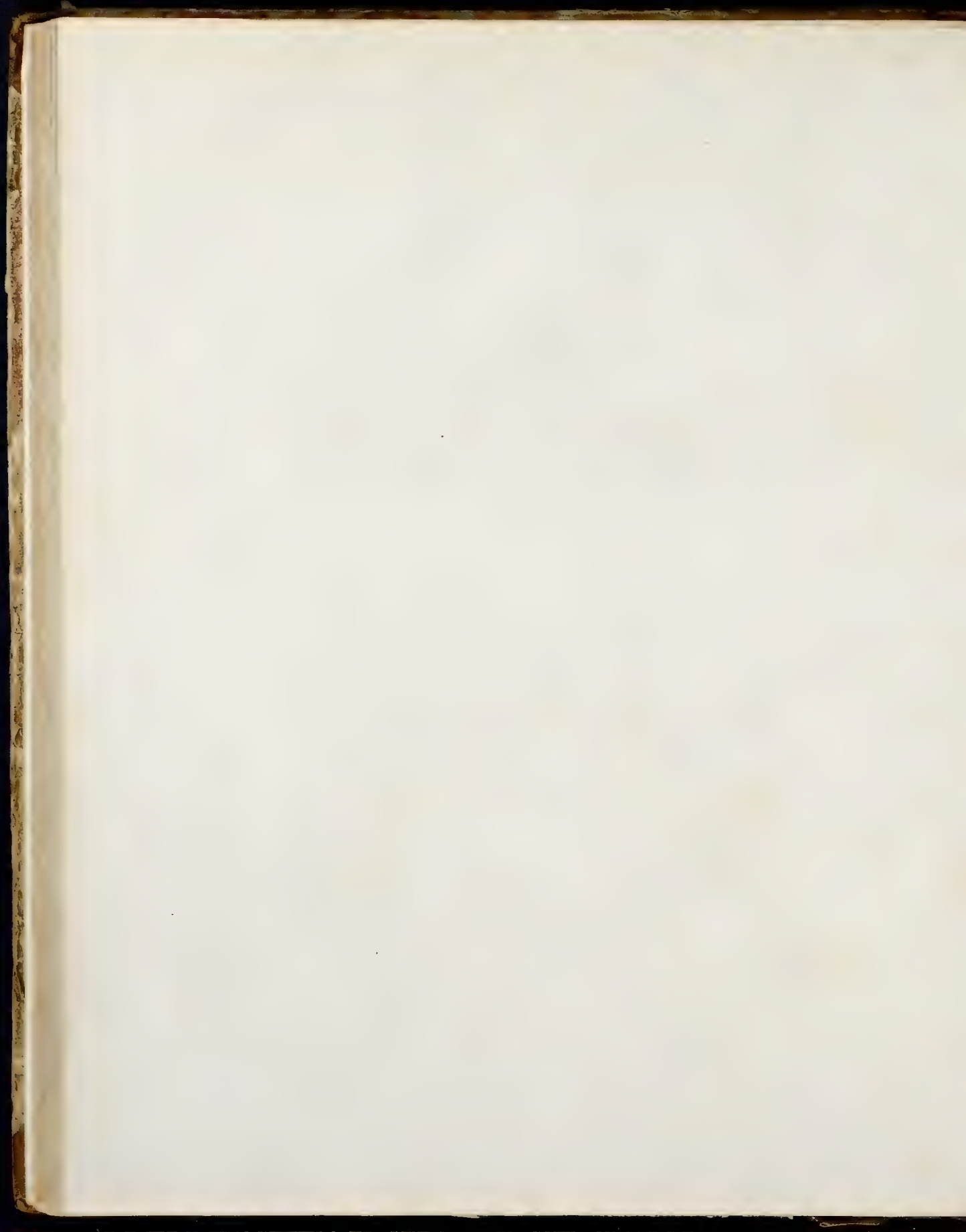
*di Giovanni Battista*

*di Michelangelo*





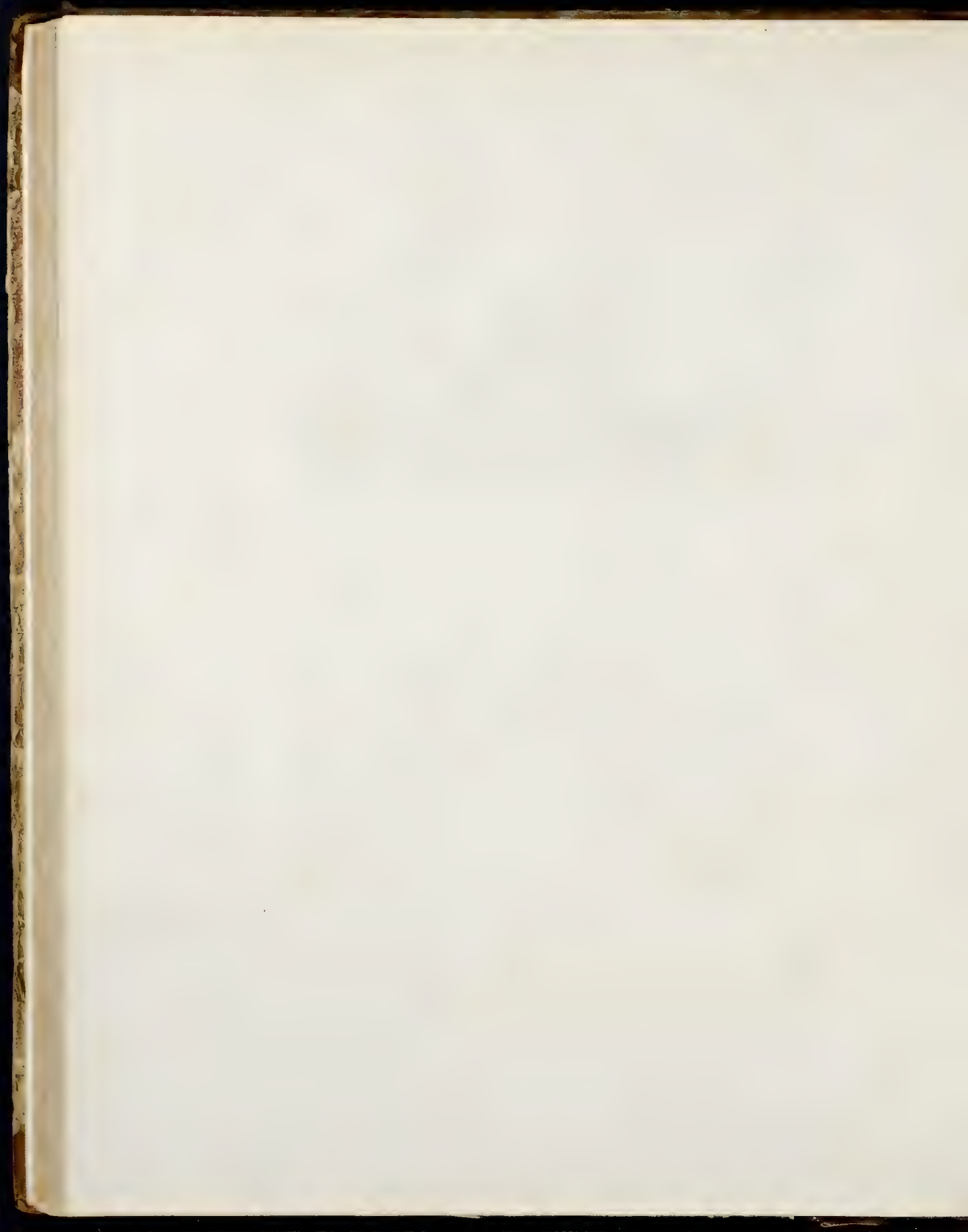


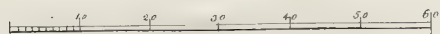
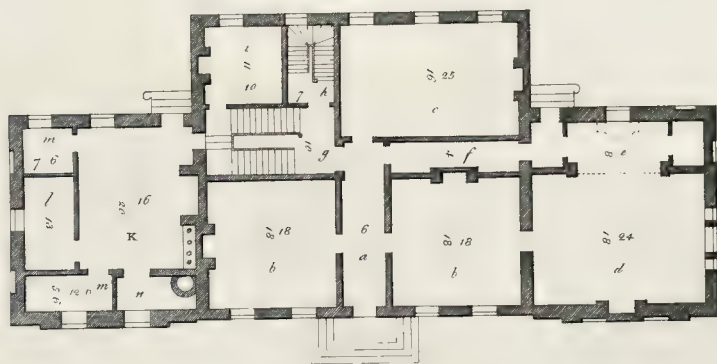




*A. P. 1780. 1781. 1782.*

*A. P. 1780. 1781. 1782.*

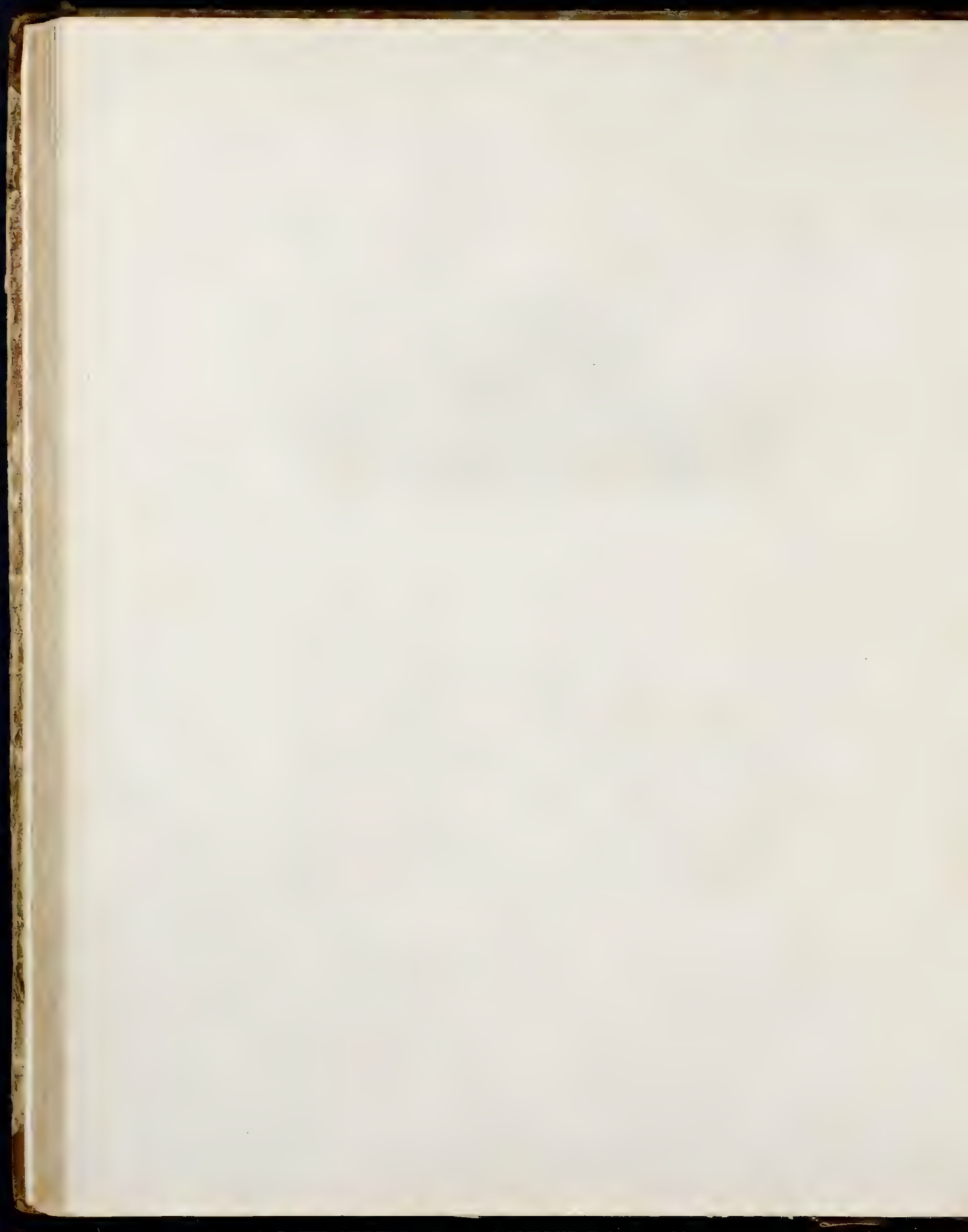


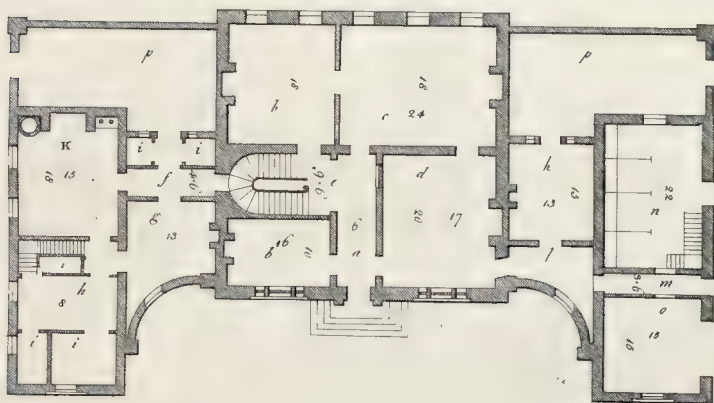


J. Rawlinson sculp.

J. T. Hutton sculp.



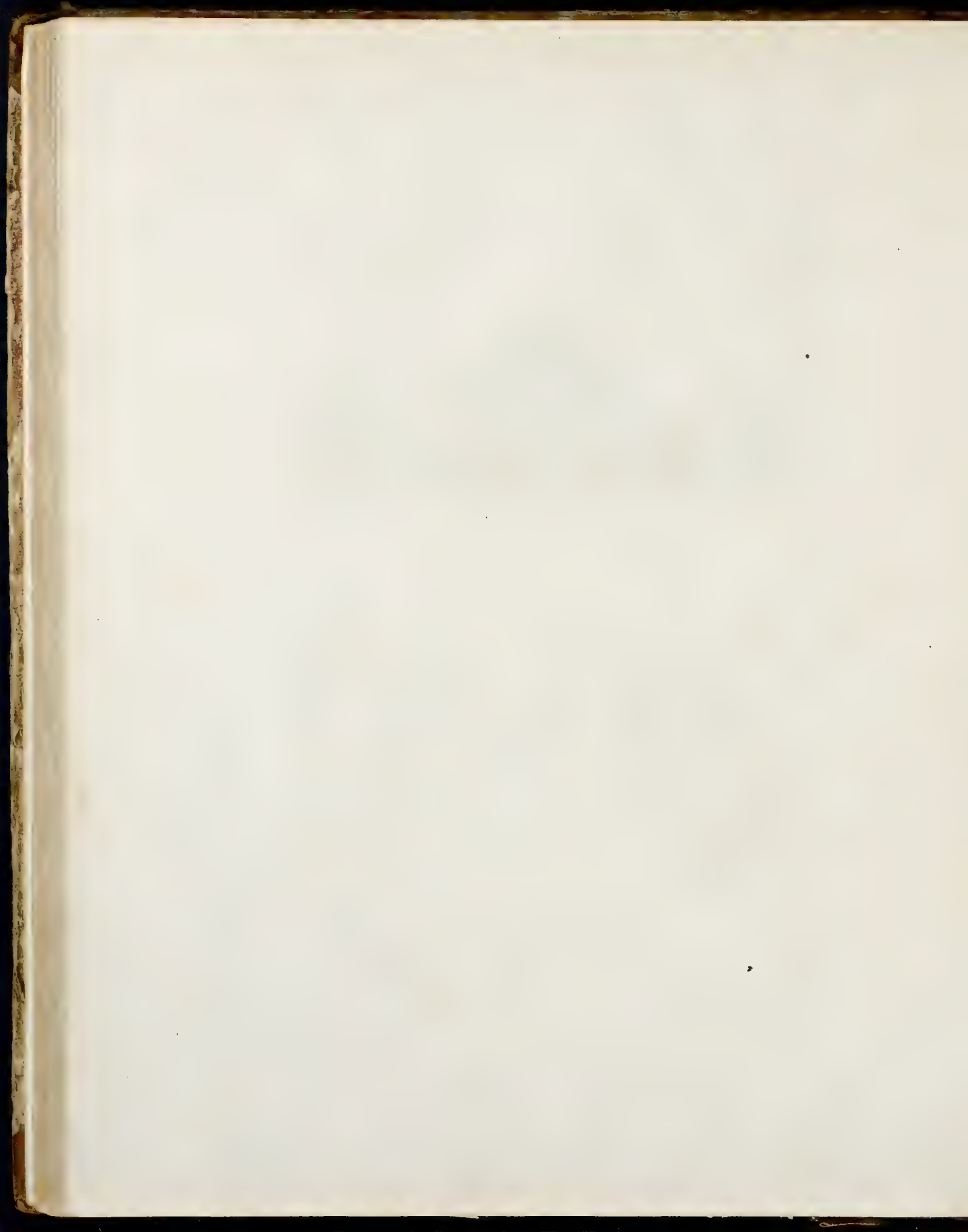


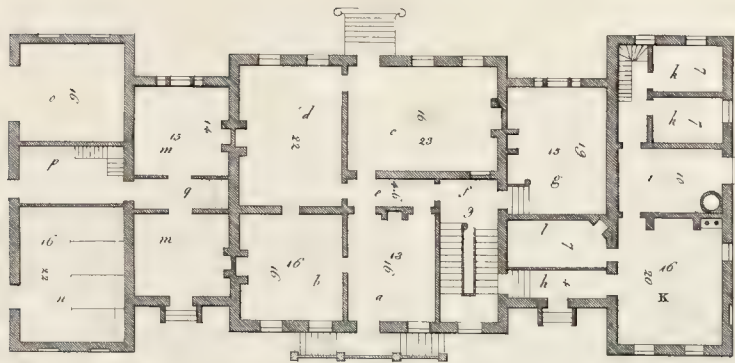


60 feet

*J. Richardson sculp. del.*

*J. H. Miller sc.*



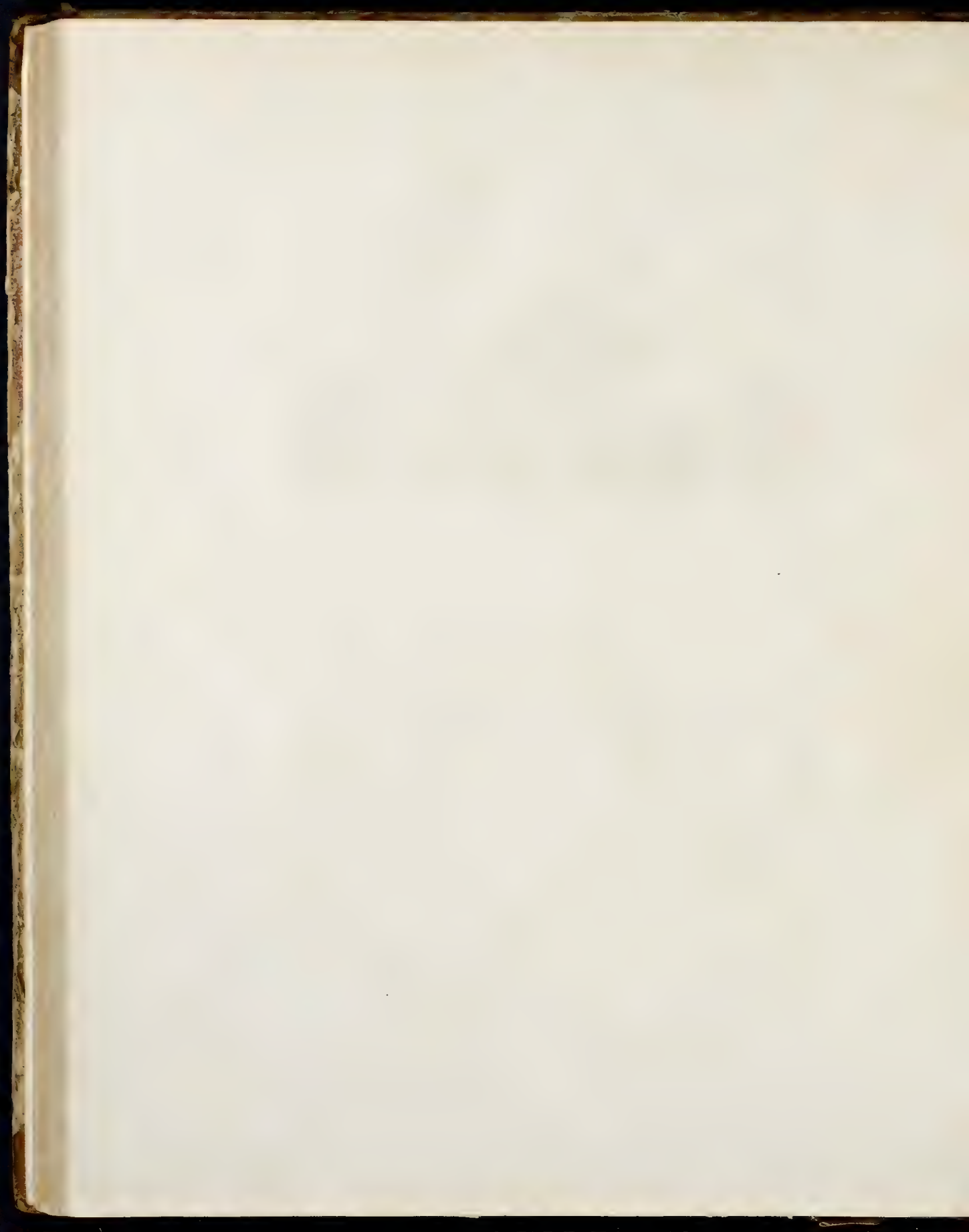


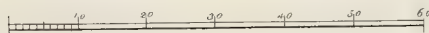
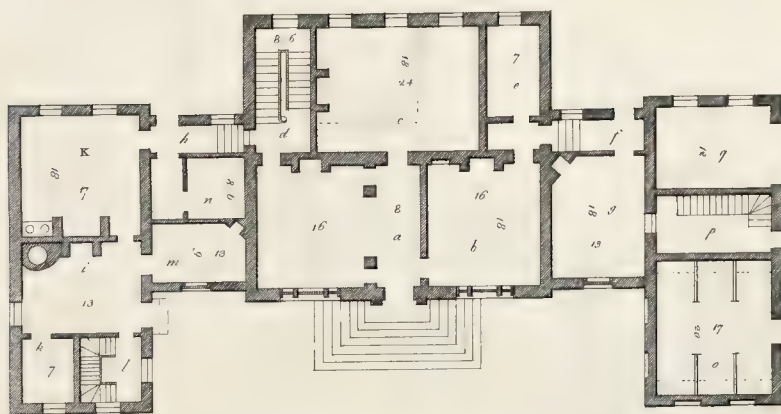
50 feet

T. B. Nichols m. d. d. d.

T. A. Miller sc.

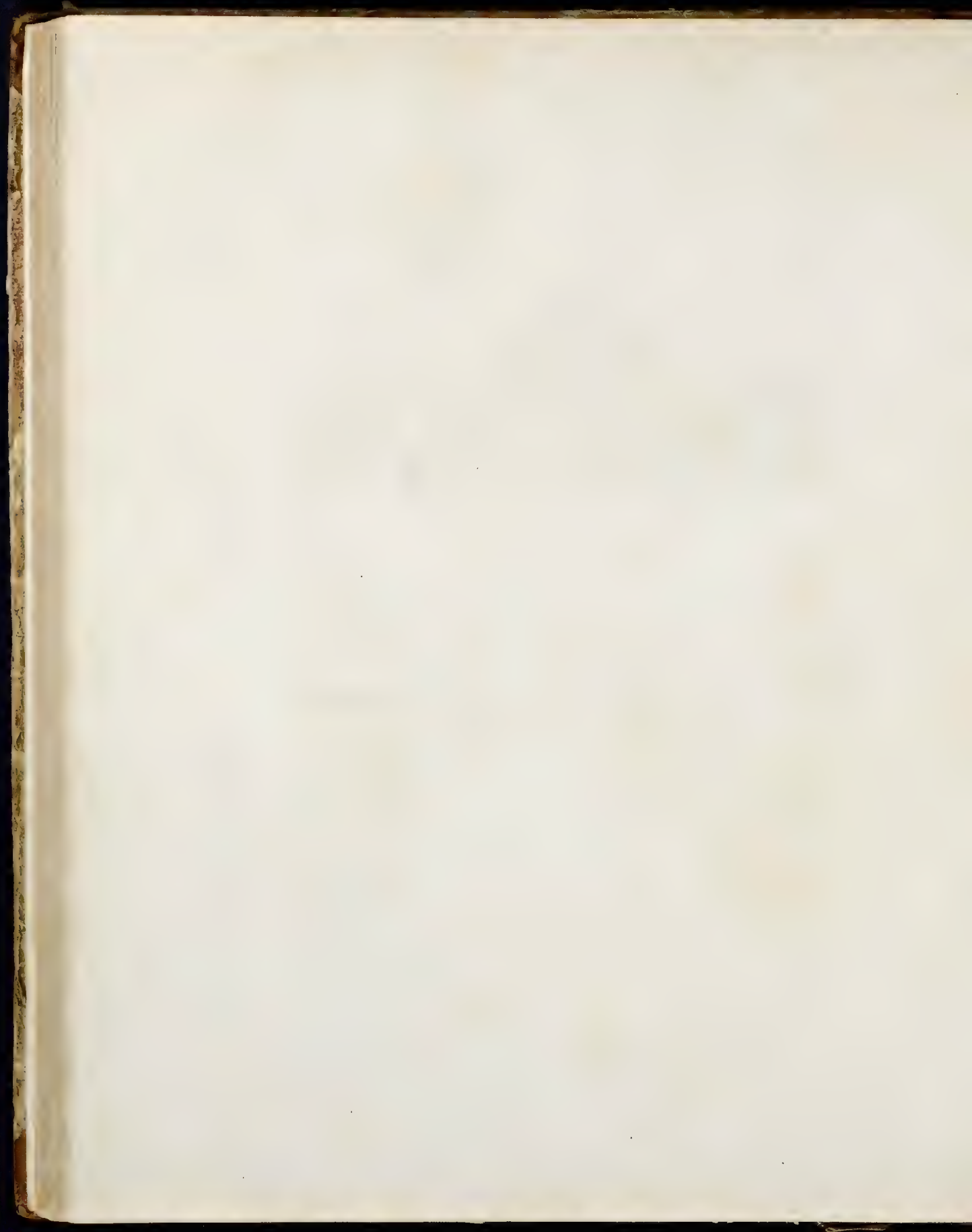






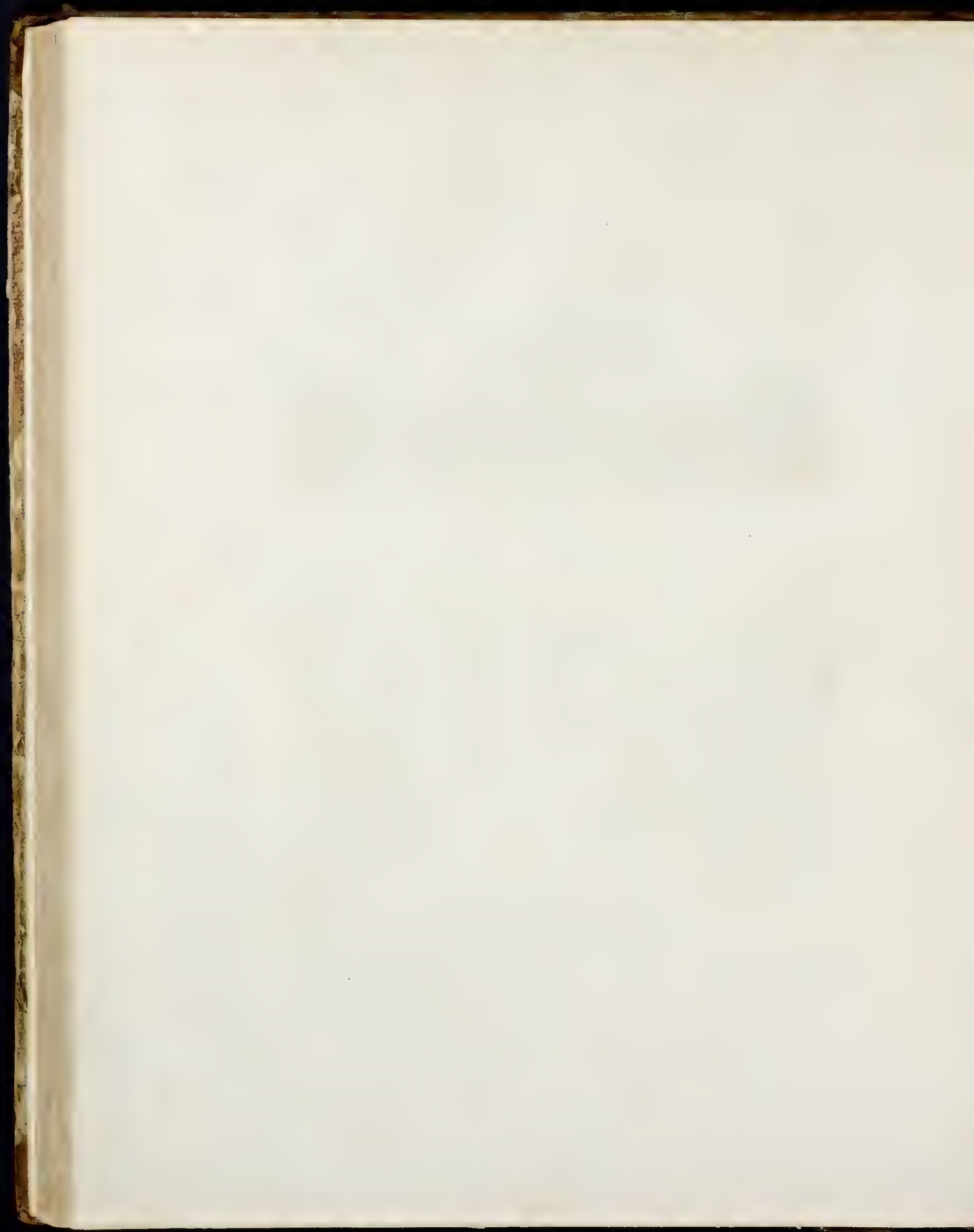
J. Reuben. archit.

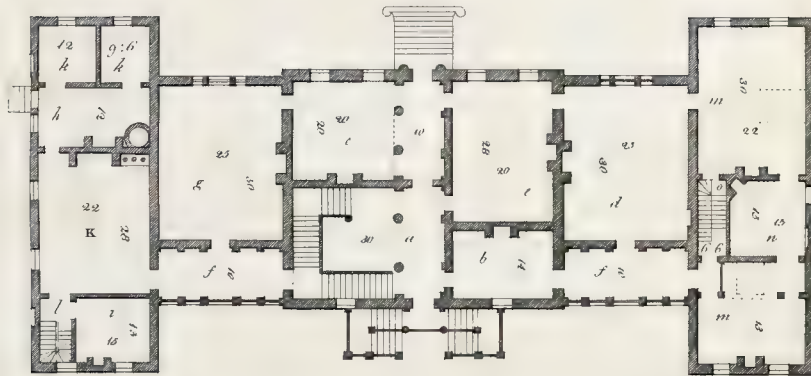
J. Miller sculp.







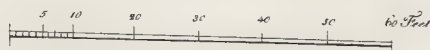




*S. Richardson del.*

*T. Miller sculp.*

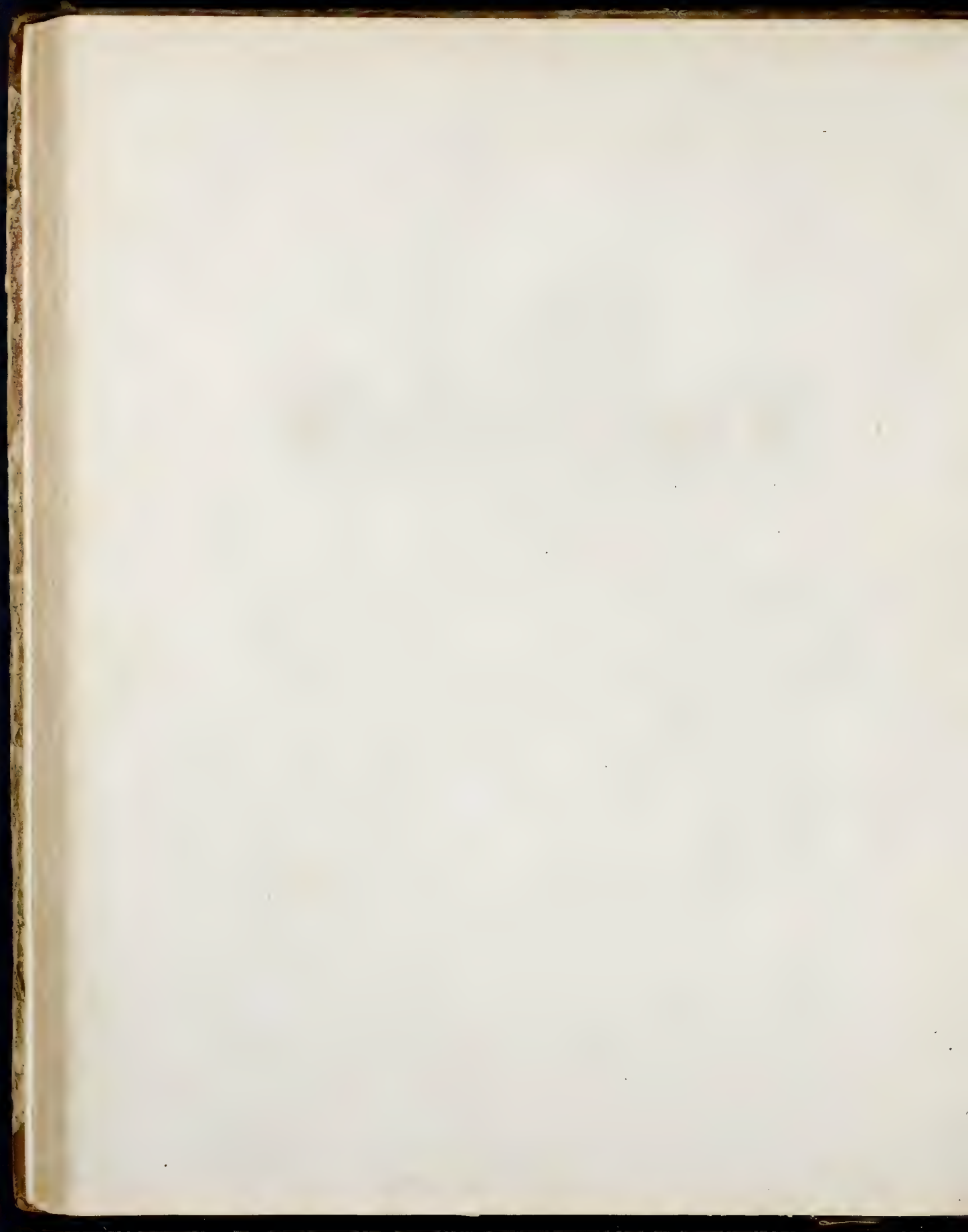




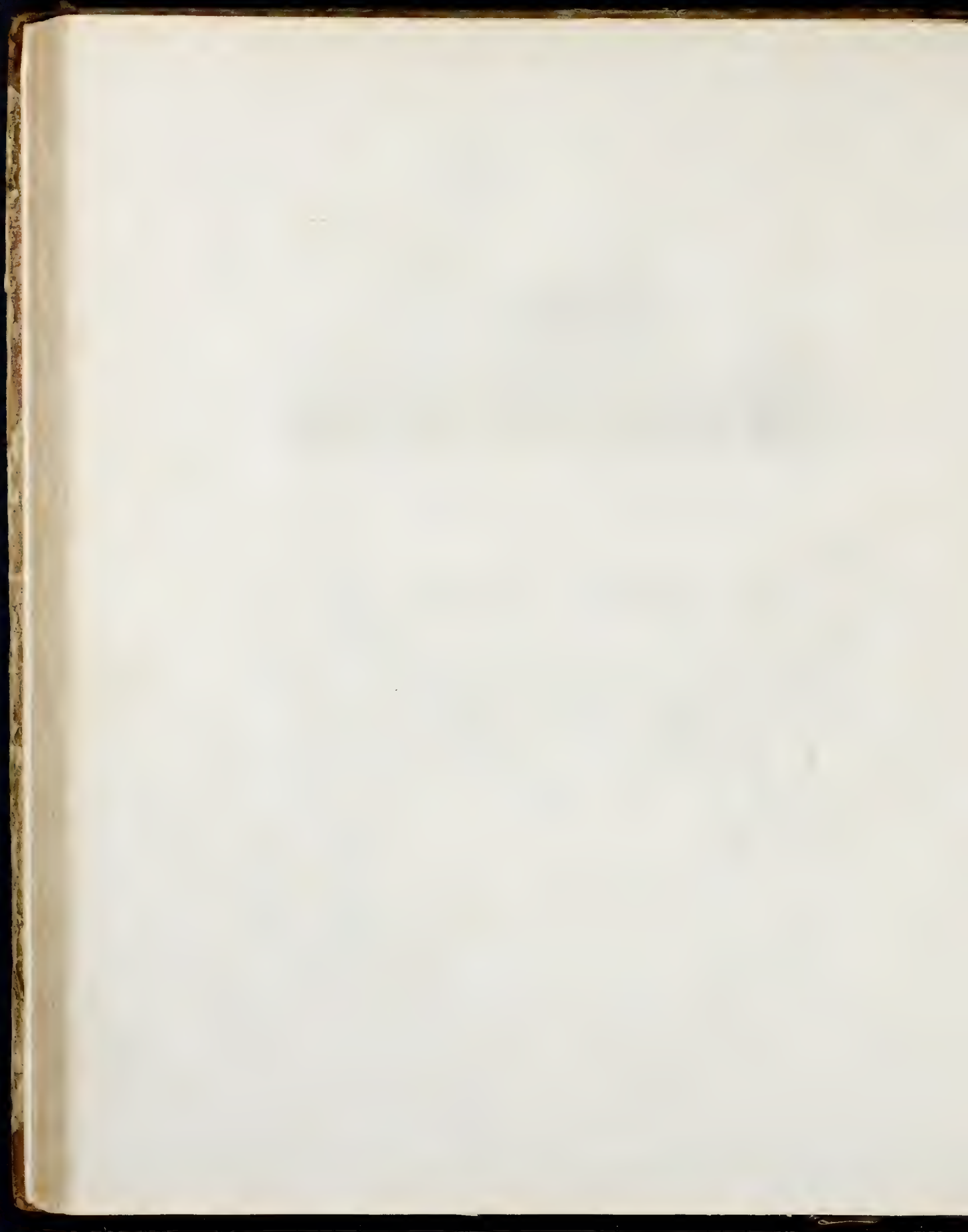
T. Rowland on wall

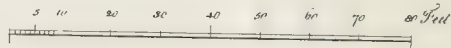
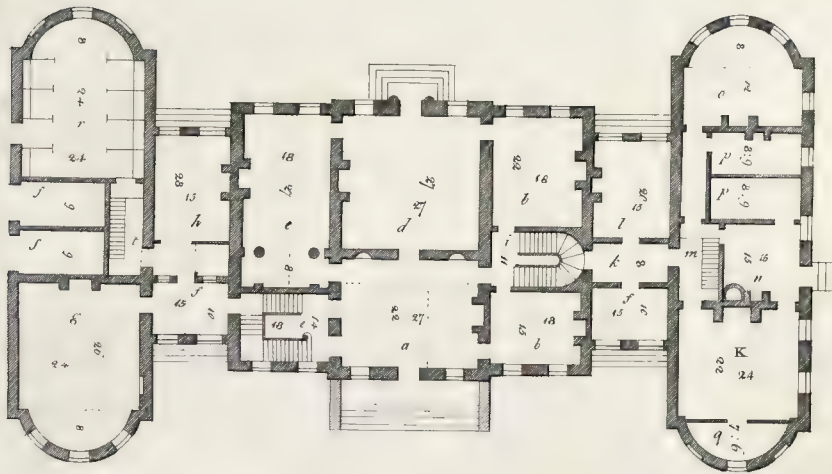
T. Miller on wall







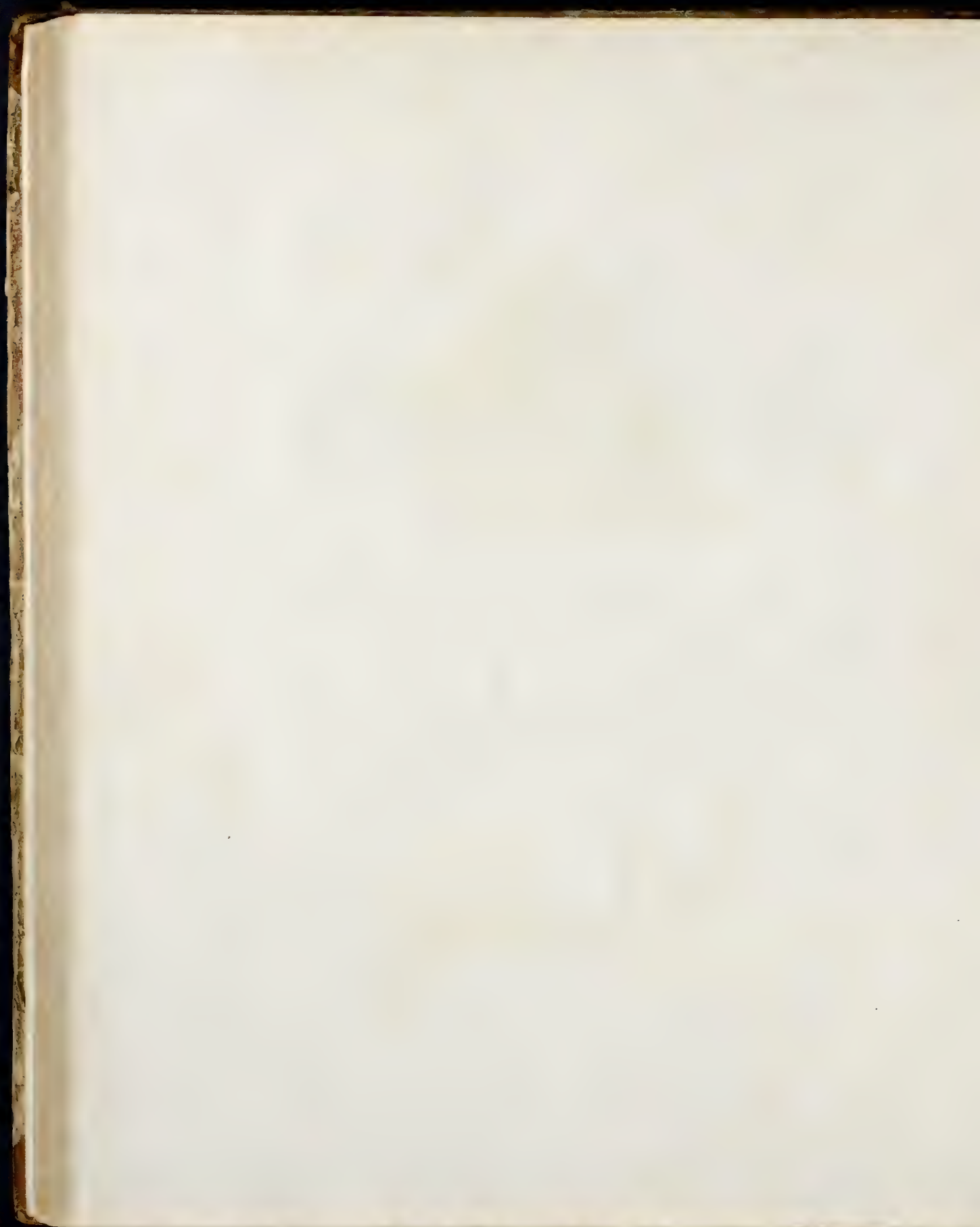


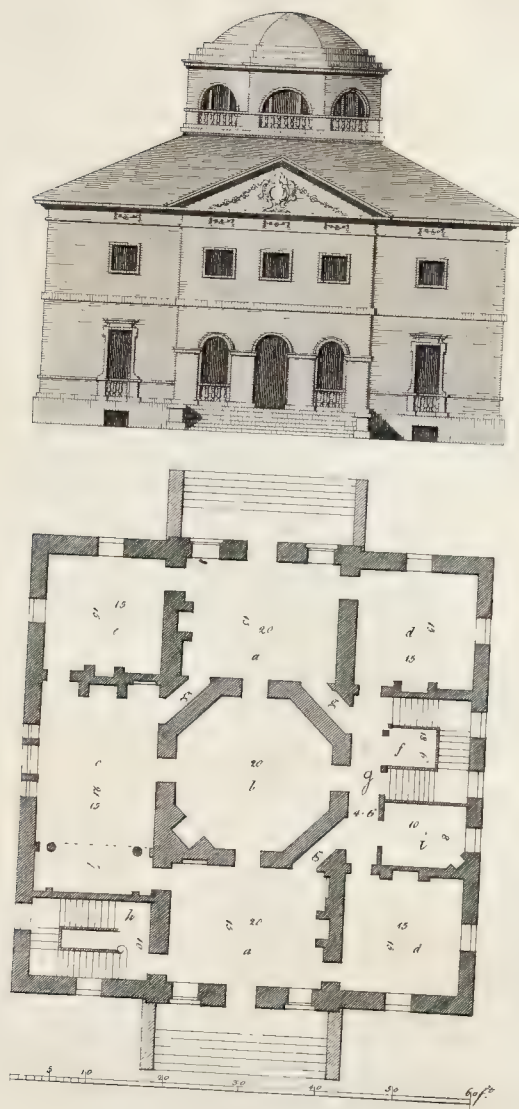


*S. Rendus en vedette*

*Le Héliosculp.*

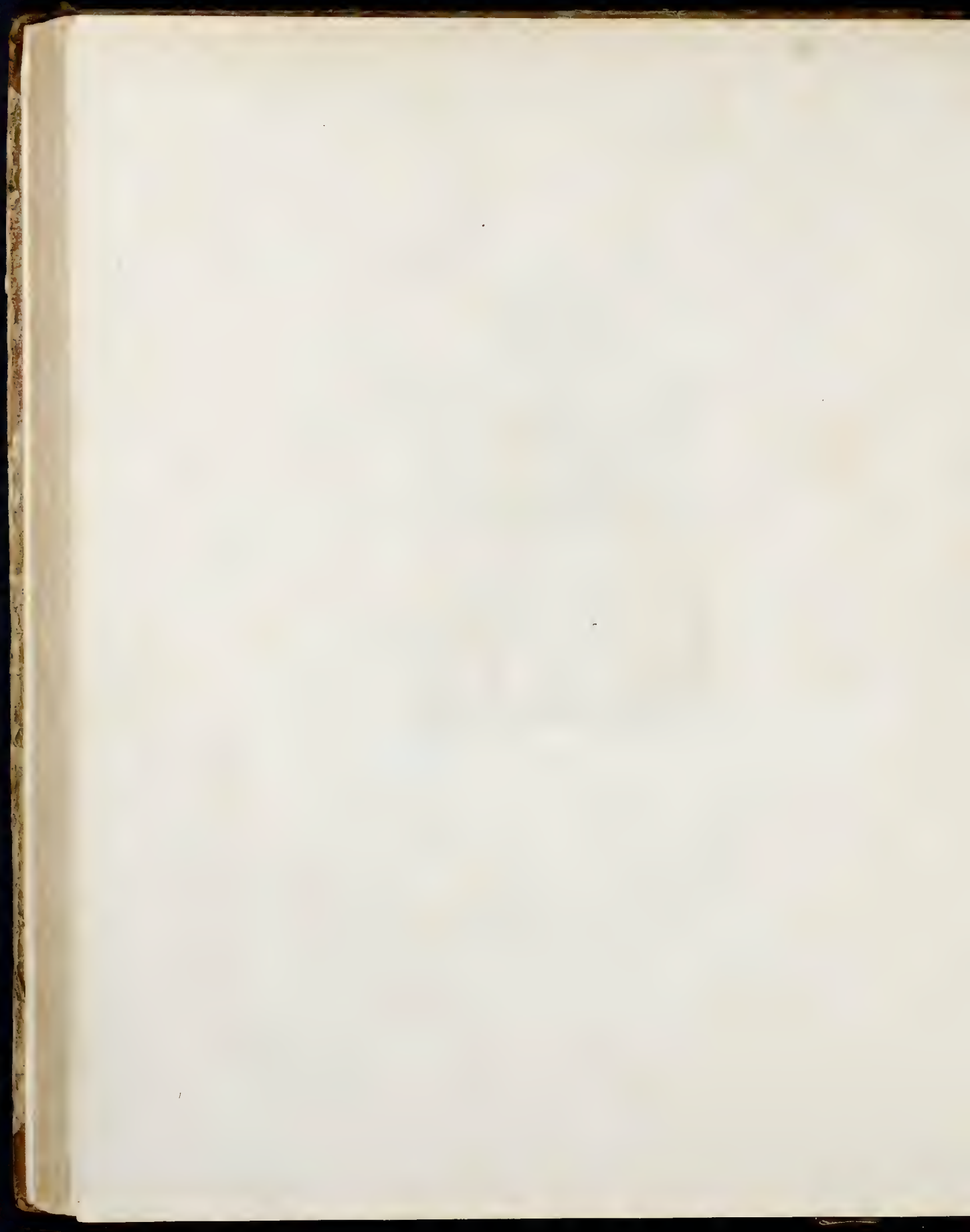






*W. Rindfleisch del.*

*T. Heller sculp.*

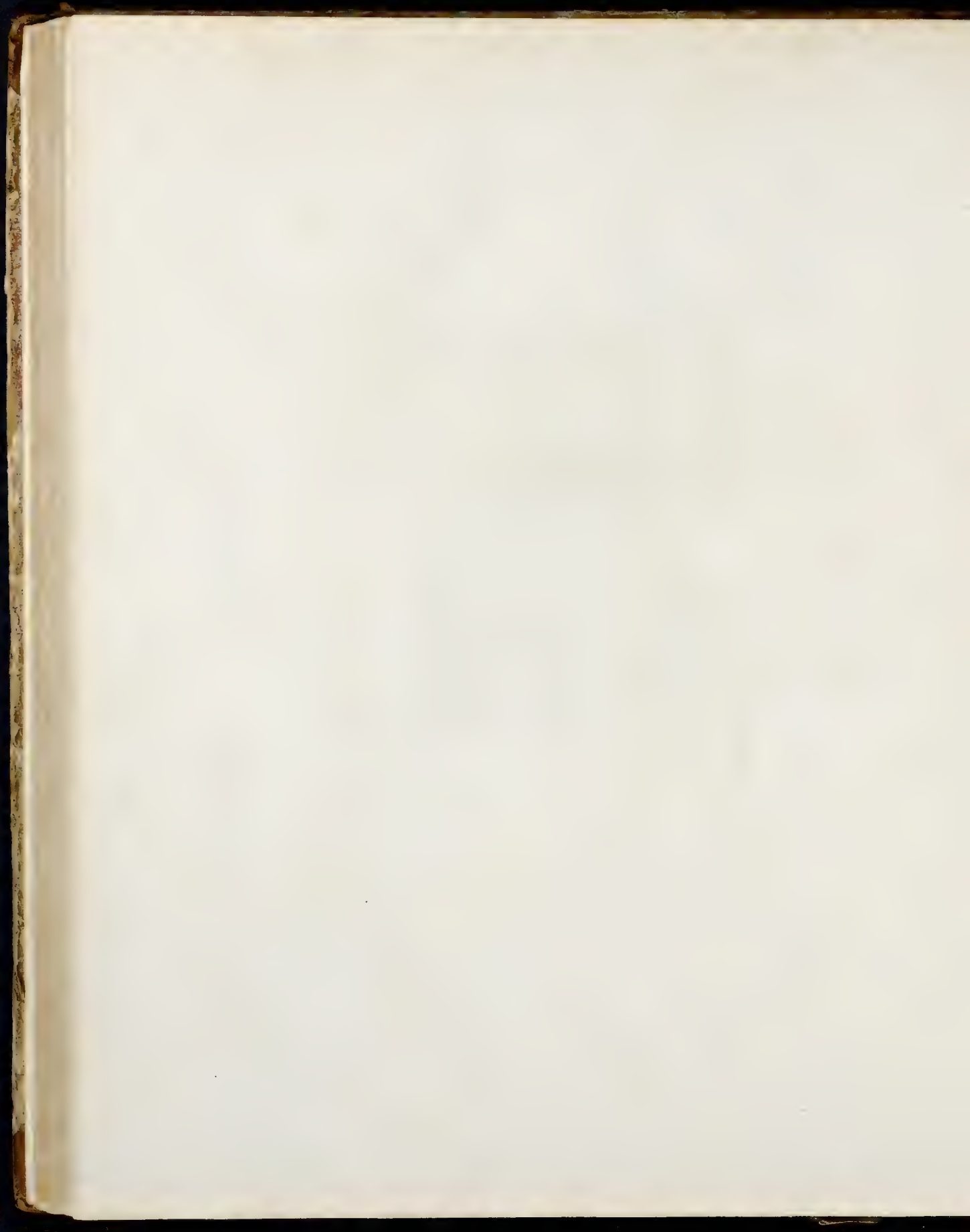


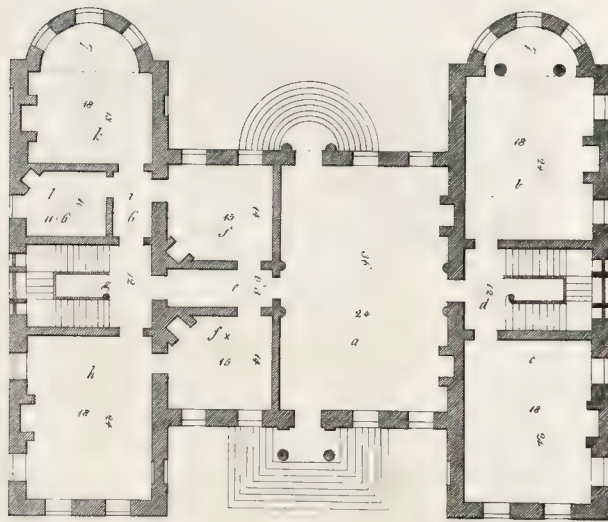


*T. Anderson sculpsit*

*T. Miller sculp.*







*Architecto del.*

*J. M. de la Cruz*

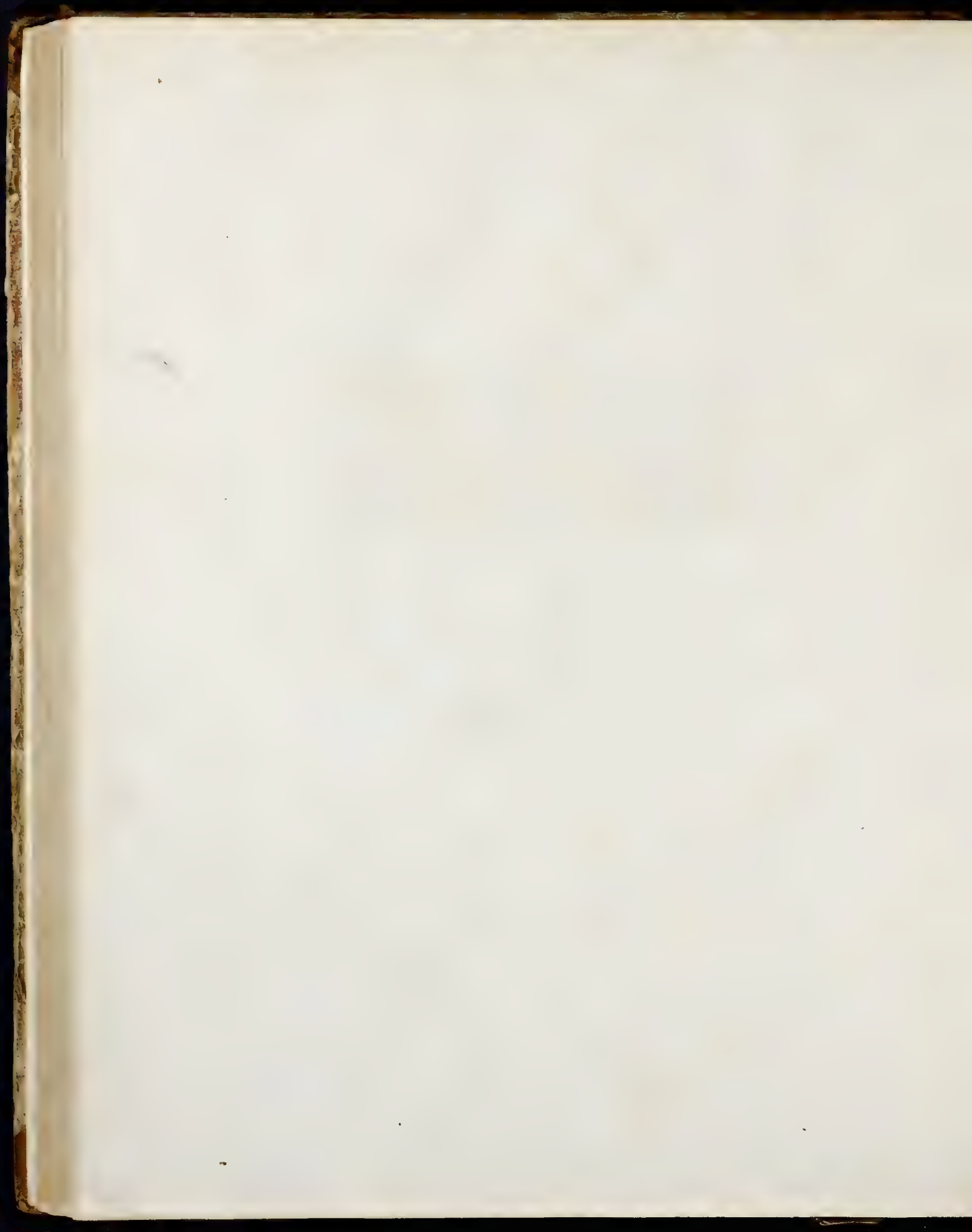




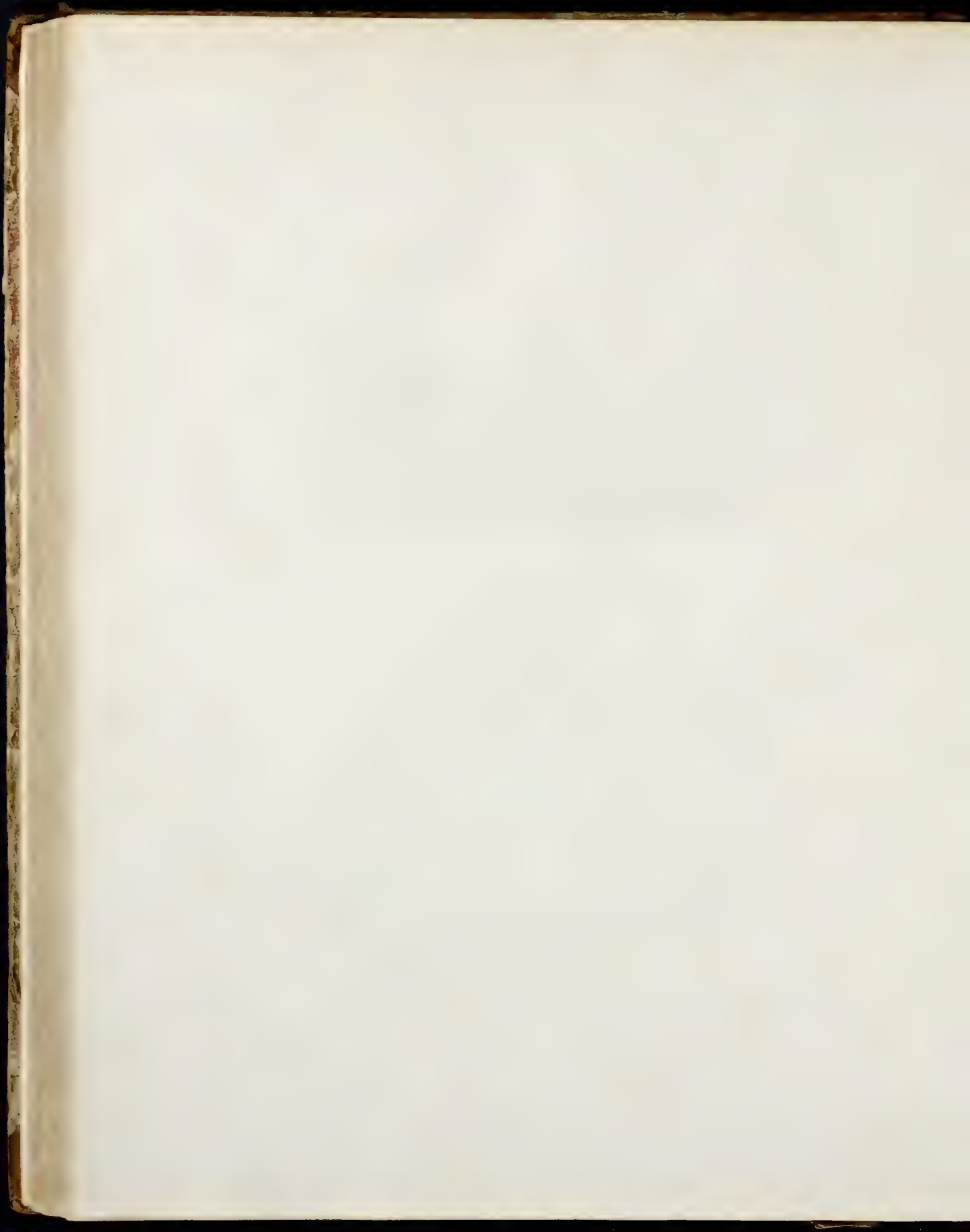
*J. Boulton sculp. et del.*

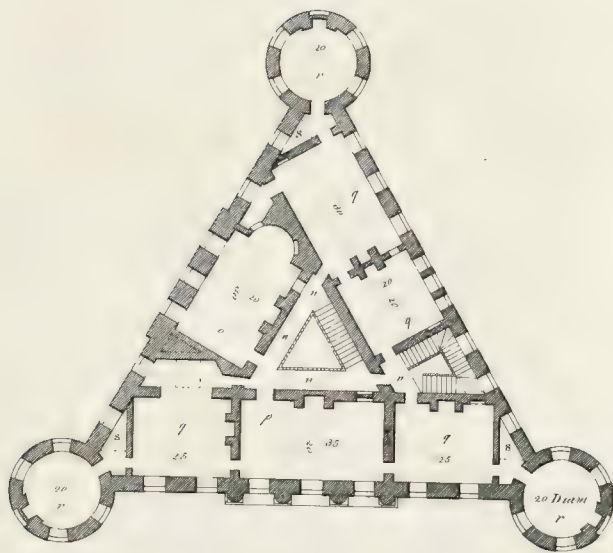
*T. M. W. sculp.*









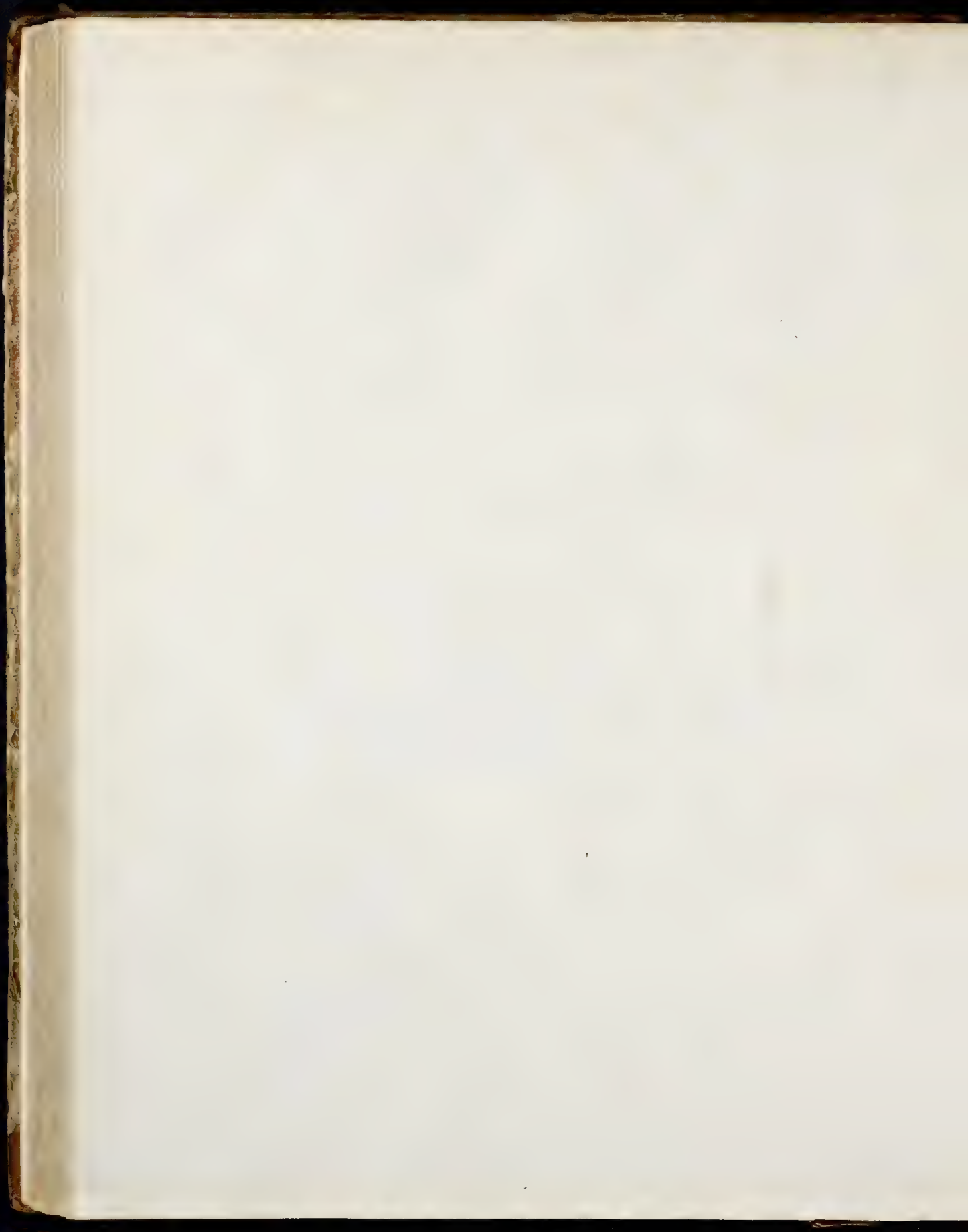


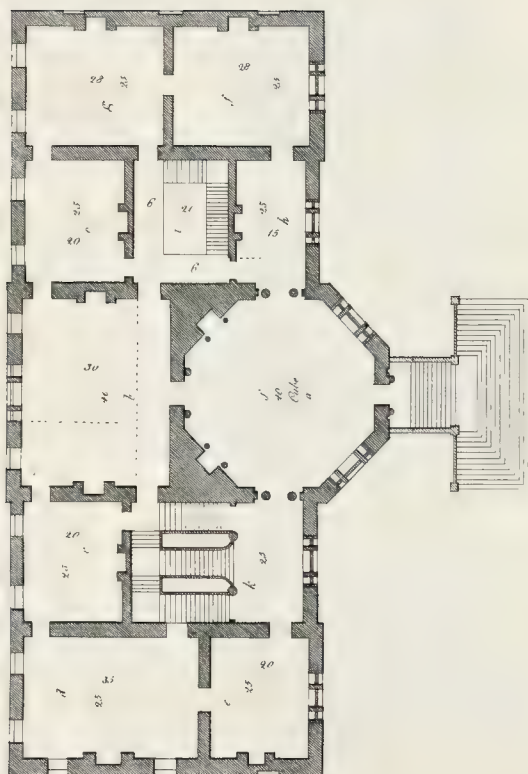
*A Plan of the principal Floor.*

*W. Rawlinson del.*

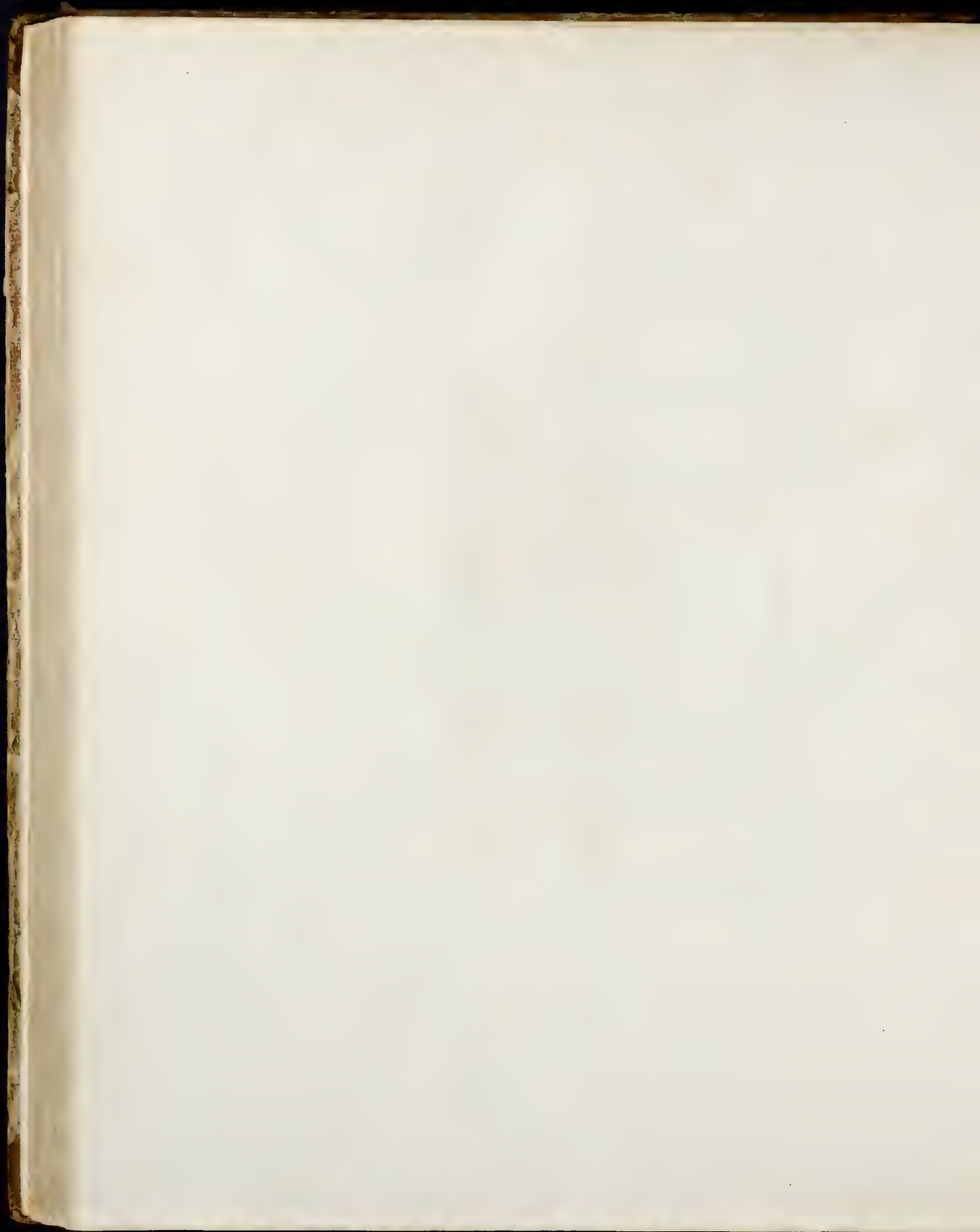
*J. A. Miller sculp.*





*et Ravenna in et del*

T. Mather Jr. & Co.

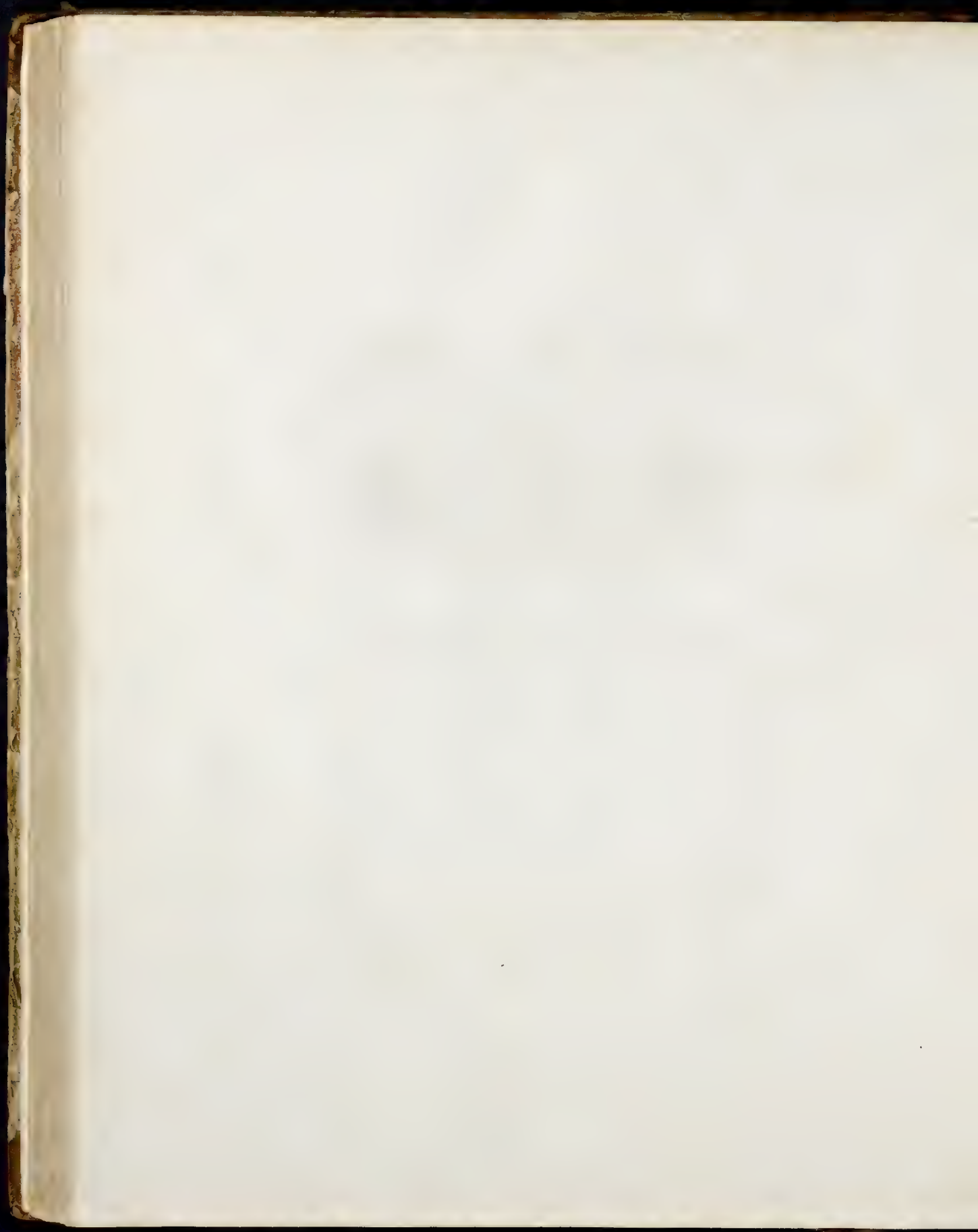


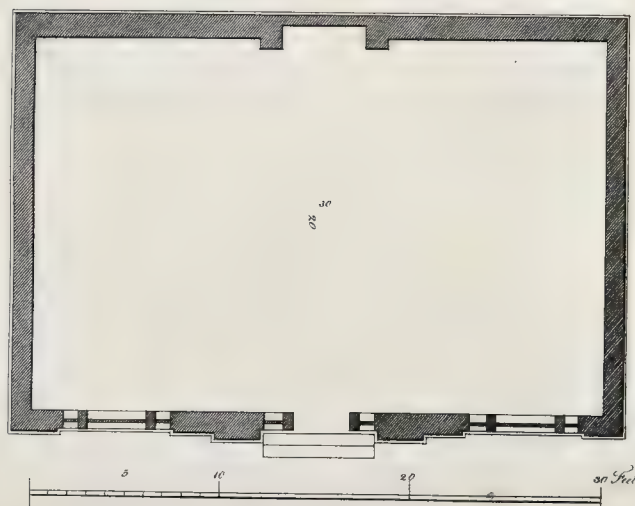


*J. Wandelaar inv. et del.*

*J. Müller sculp.*

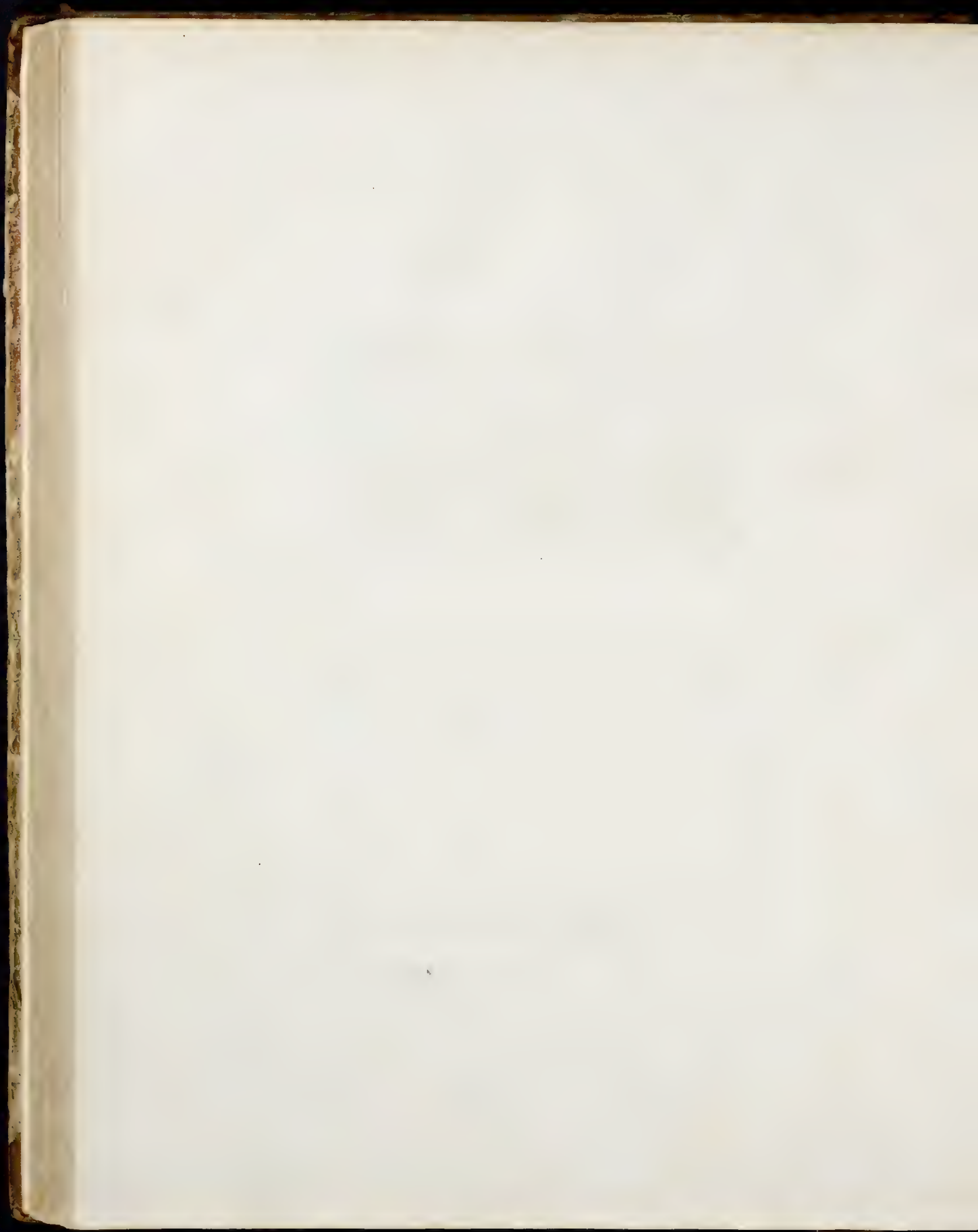


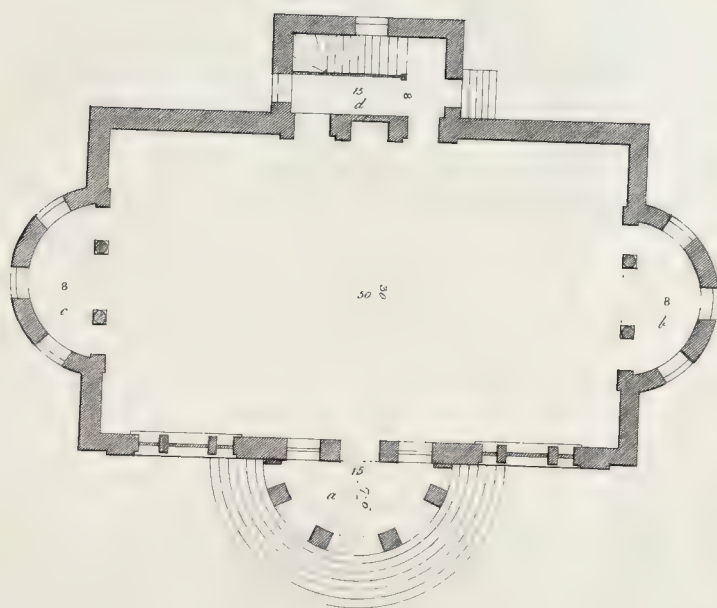




*T. Revellensius et al.*

*Ed. Miller sculp.*

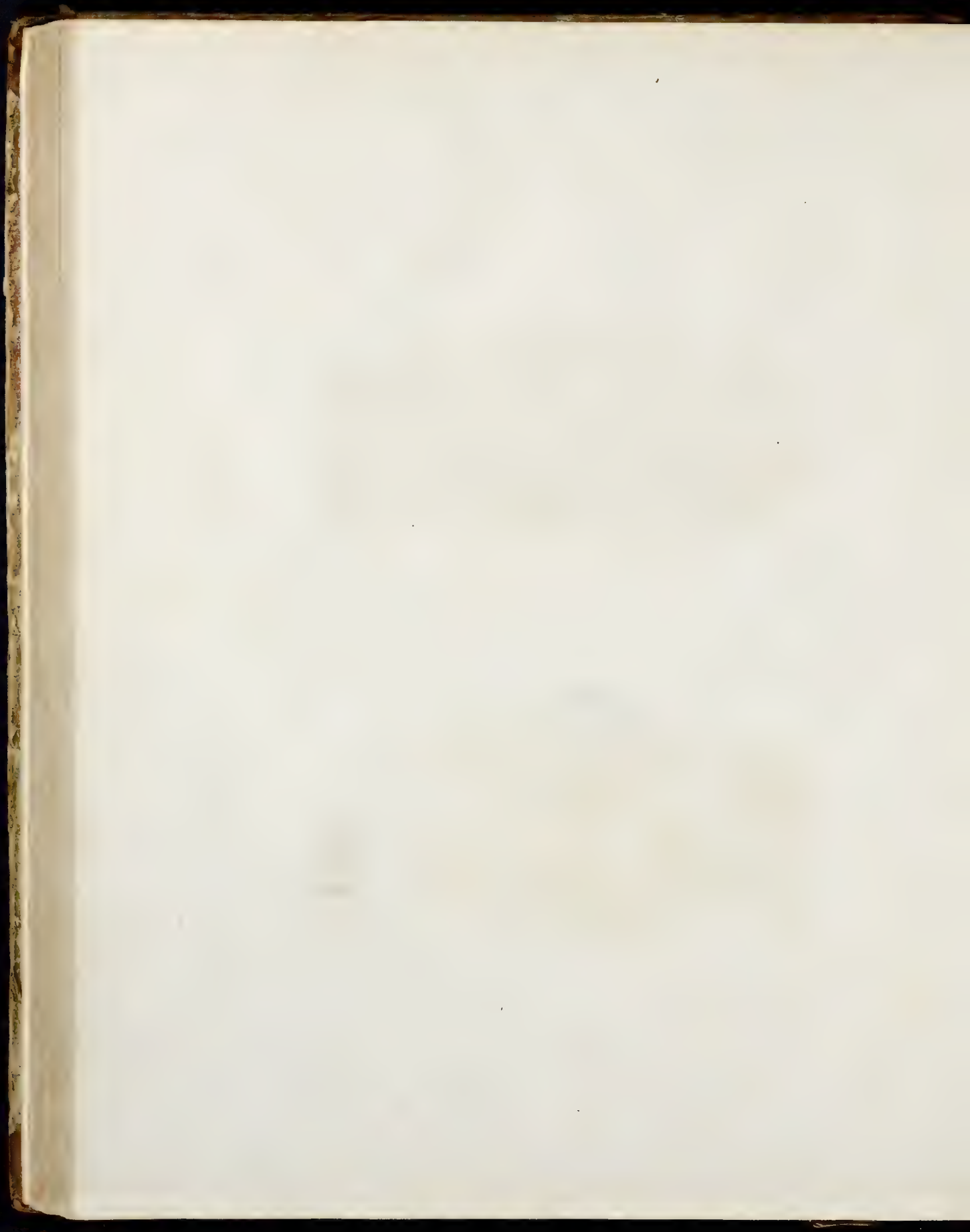


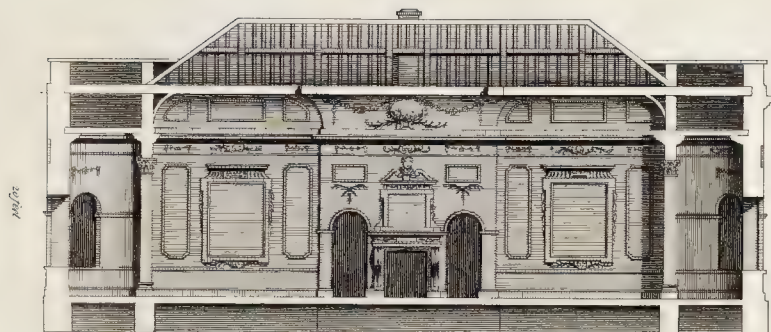


La Bastionnerie del

La Bastionnerie del







*T. Randel inv. et del.*

*T. Miller sculp.*

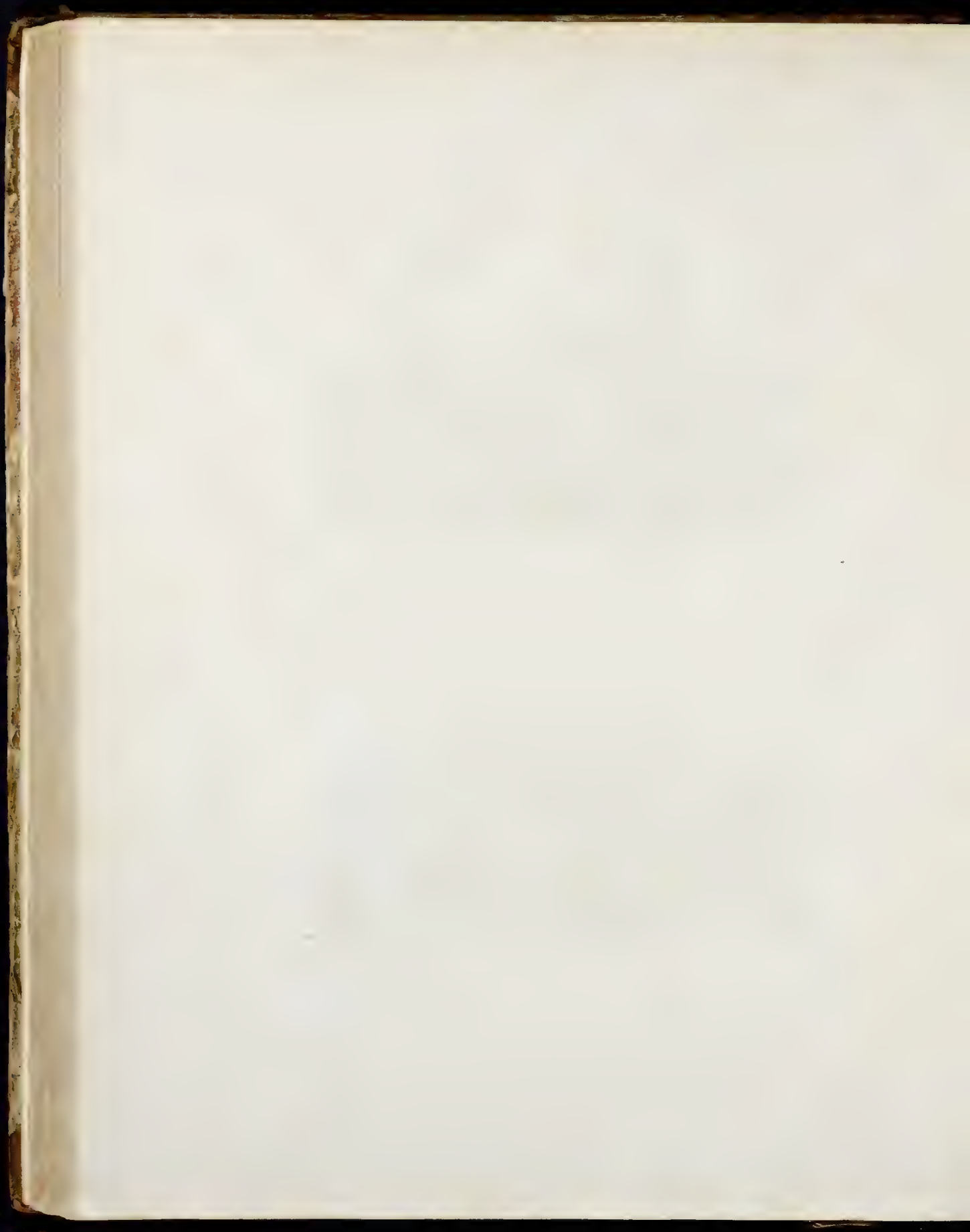
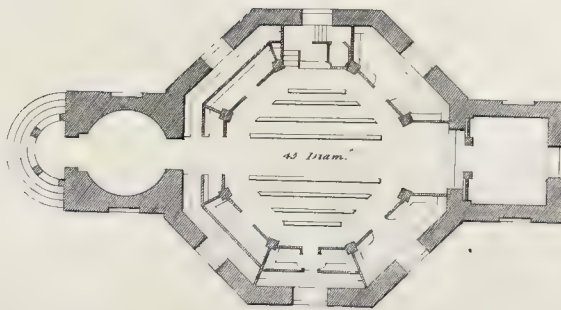


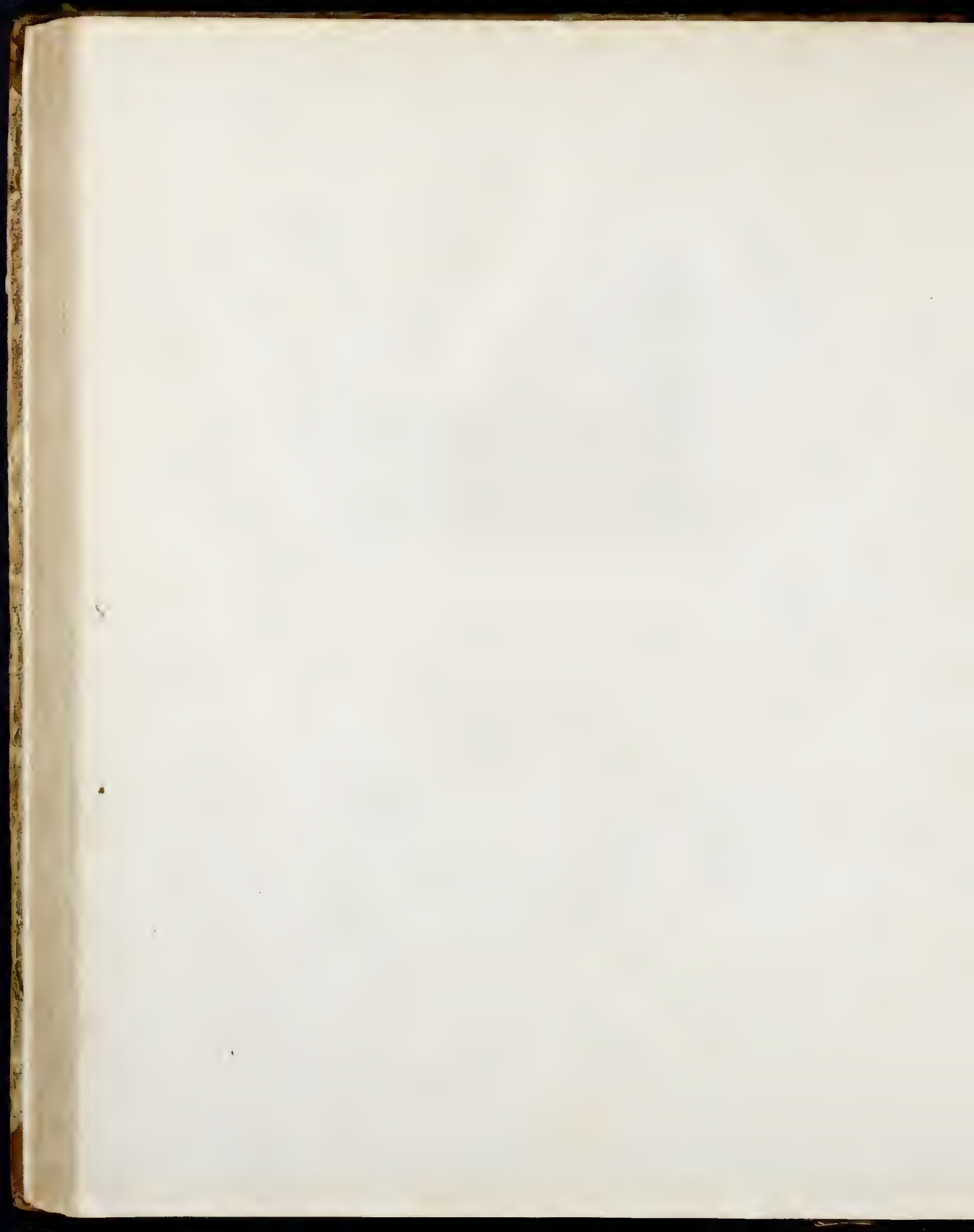
Plate XLV.

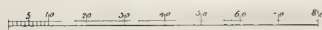
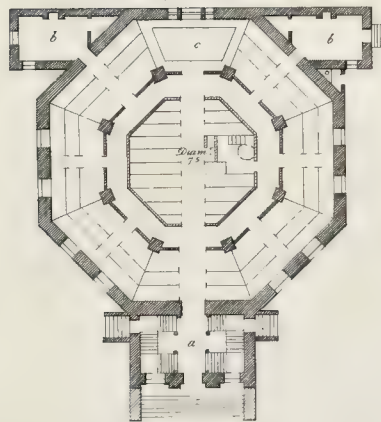


*Planned by*

*J. M. Smith*

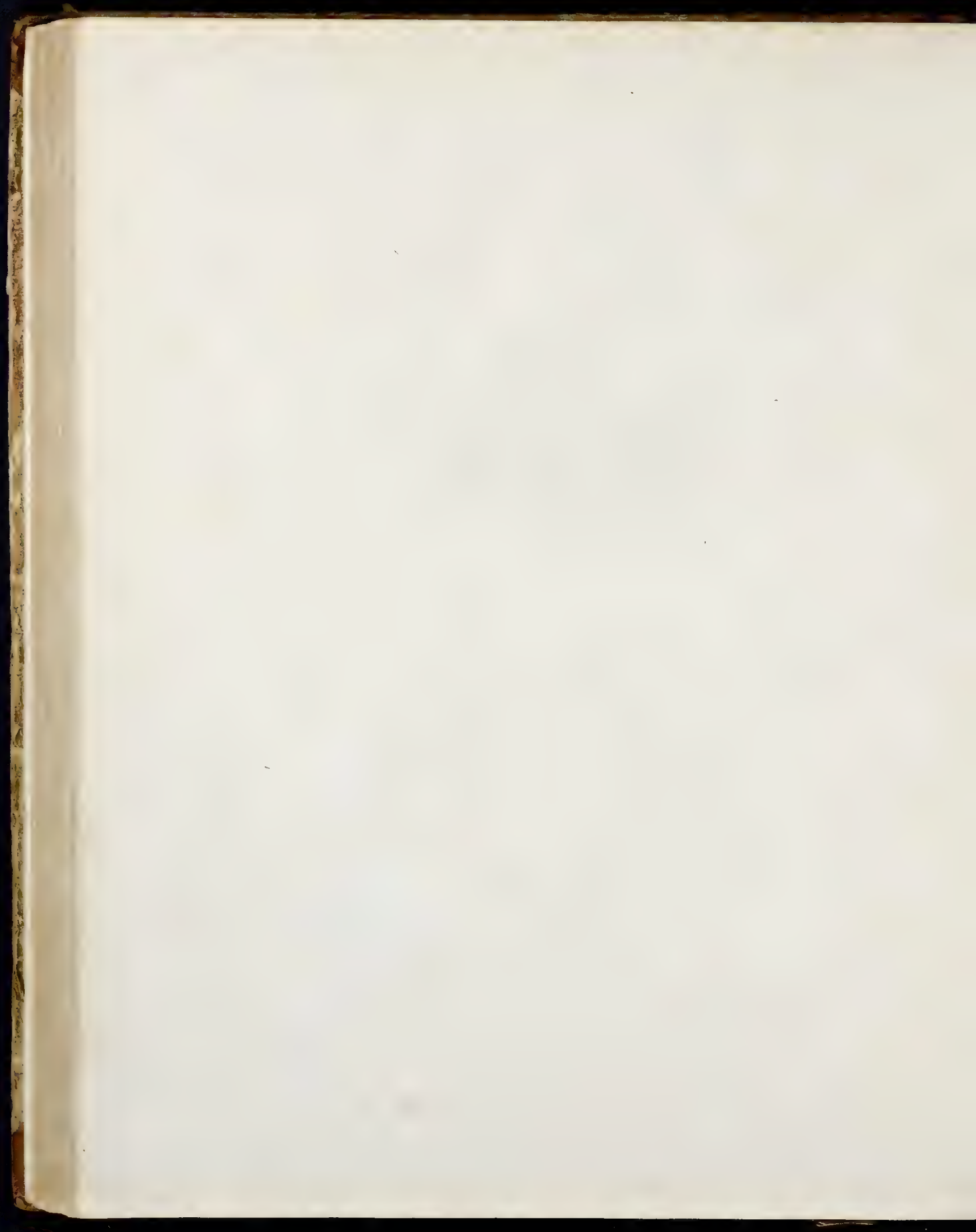


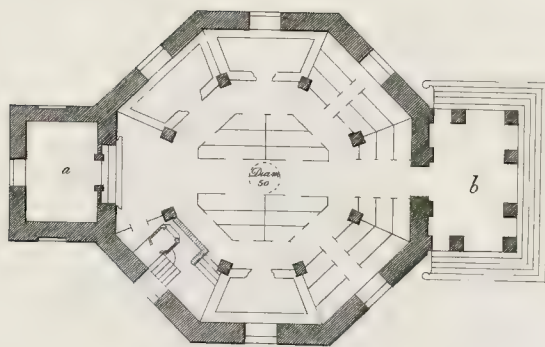




*J. Boulton inv et del*

*J. Miller sculp*

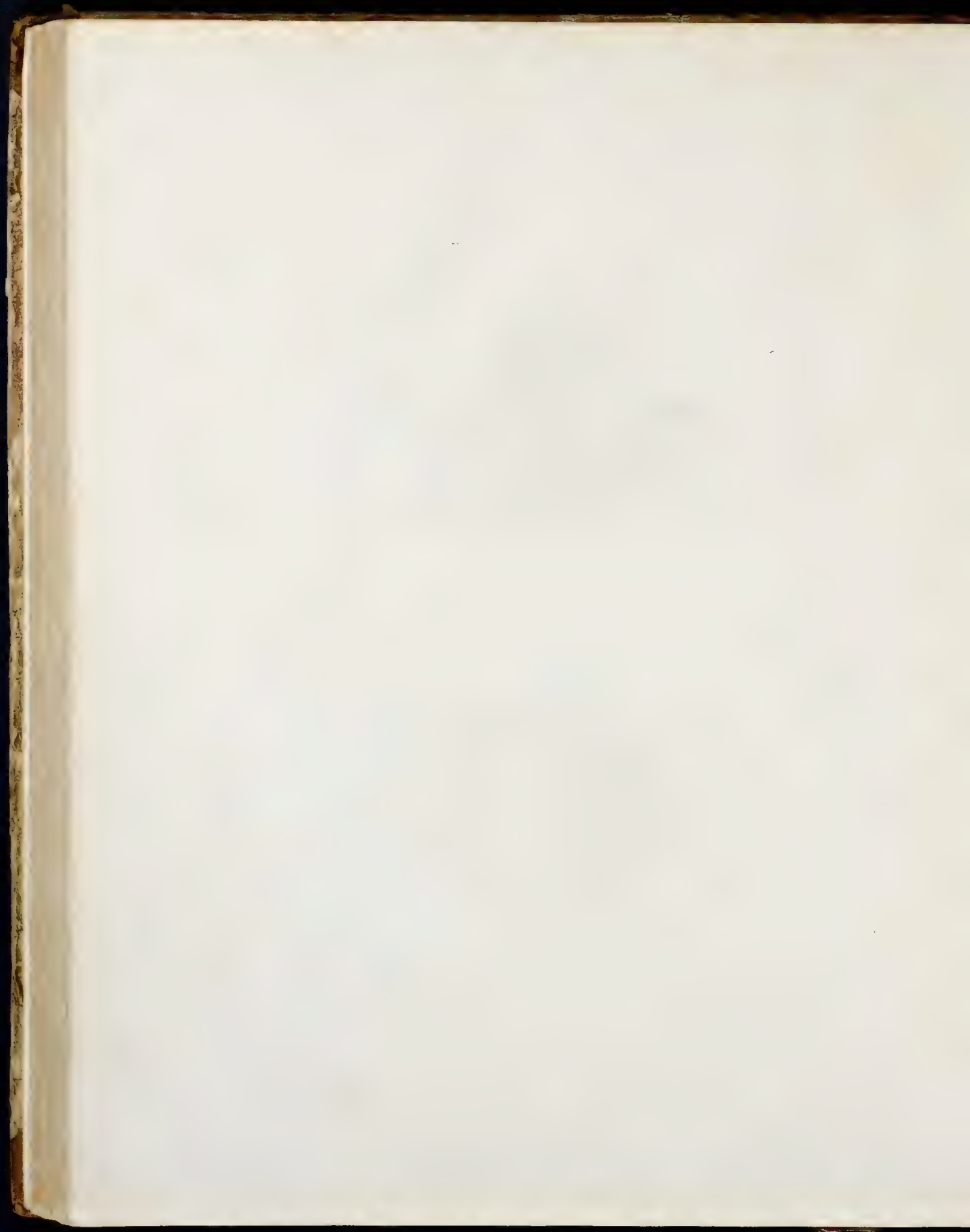


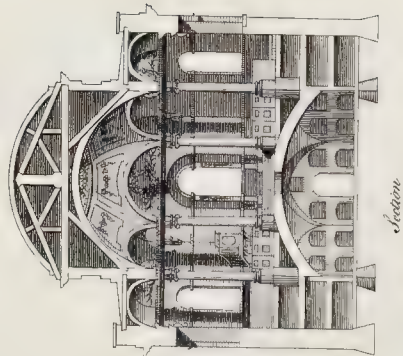
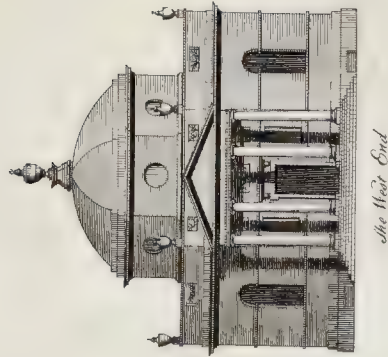


*J. Rawlins inv et del*

*J. Miller sculp*

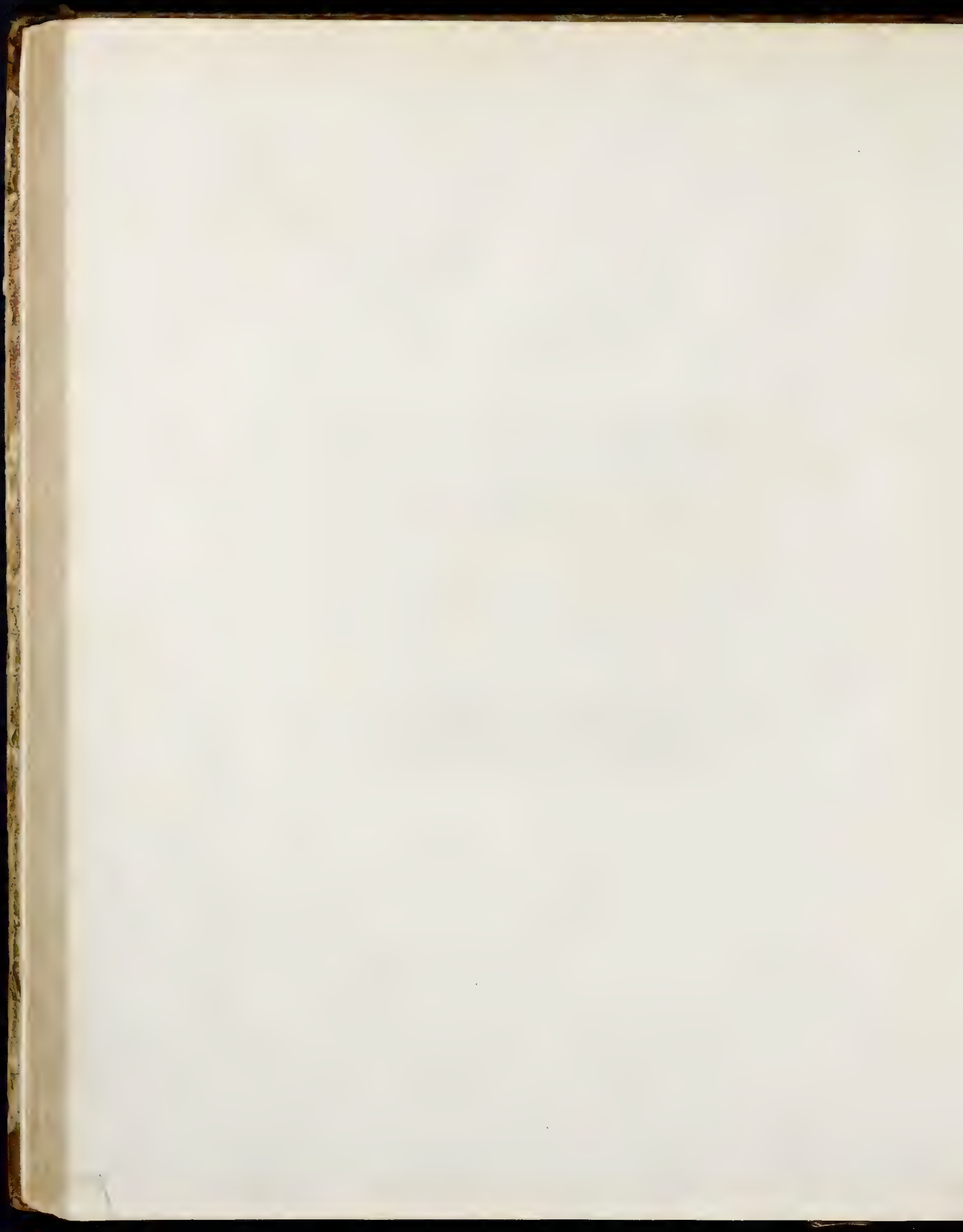


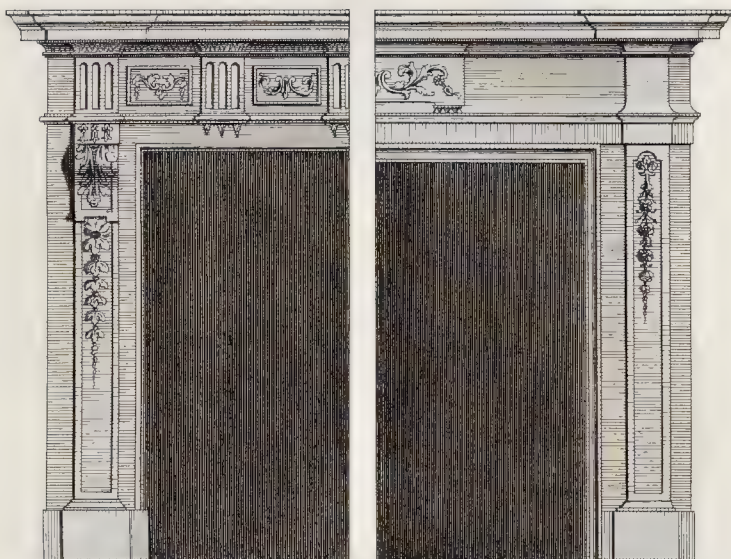




*J. Rawlins inv. et del.*

*J. Muller sculp.*

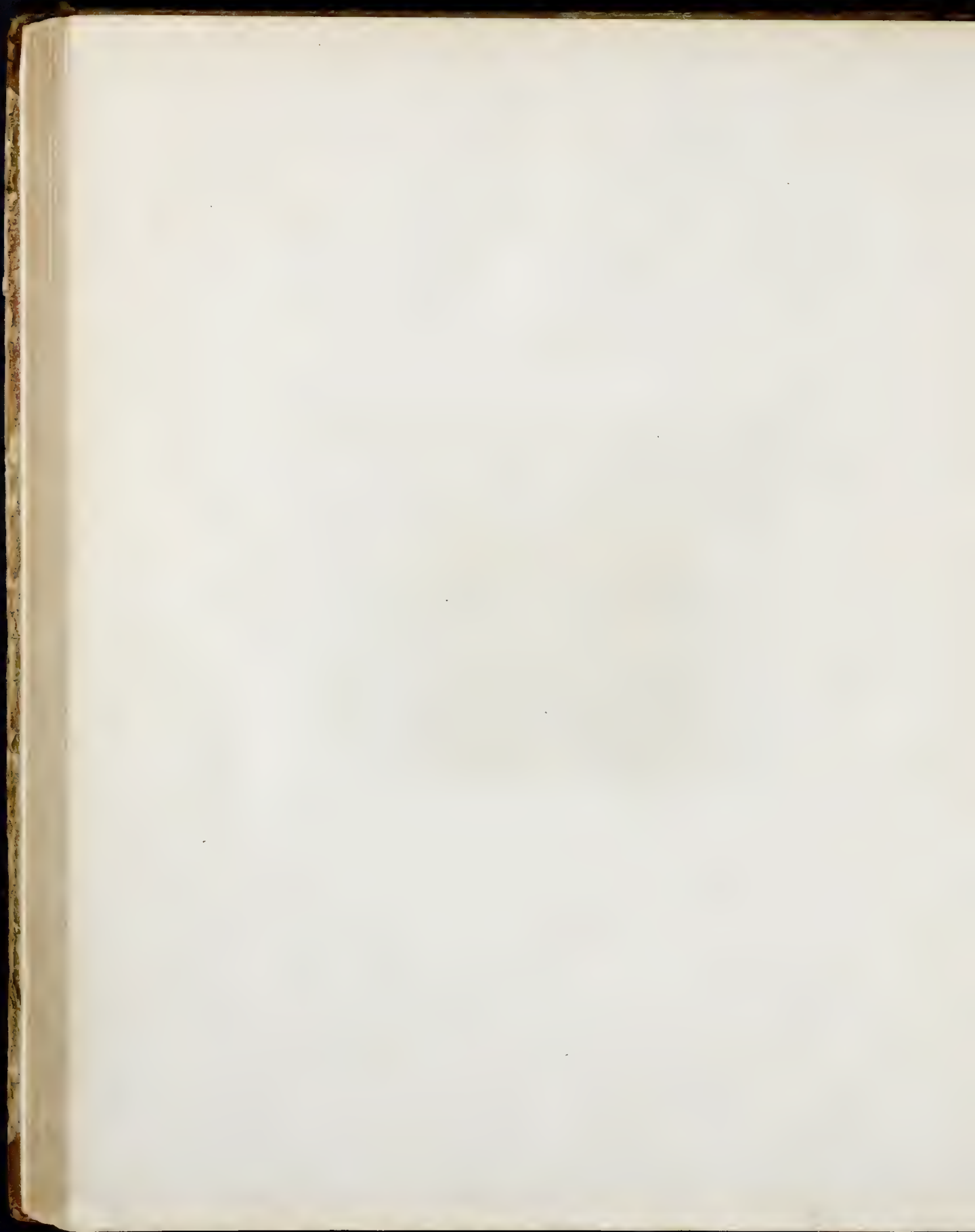


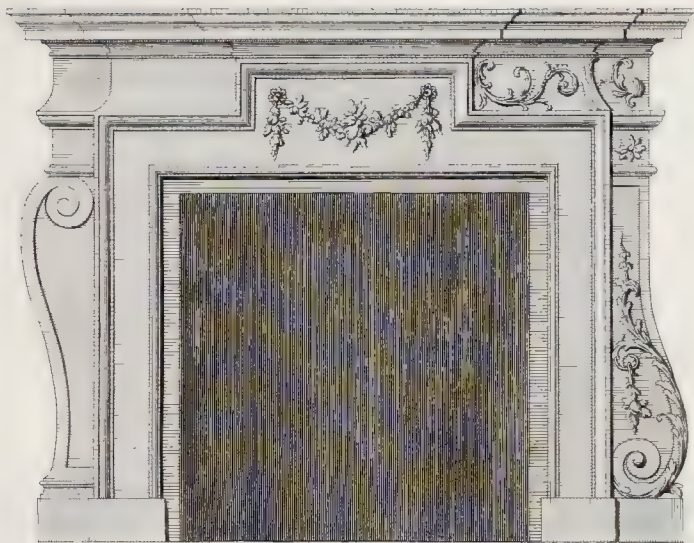


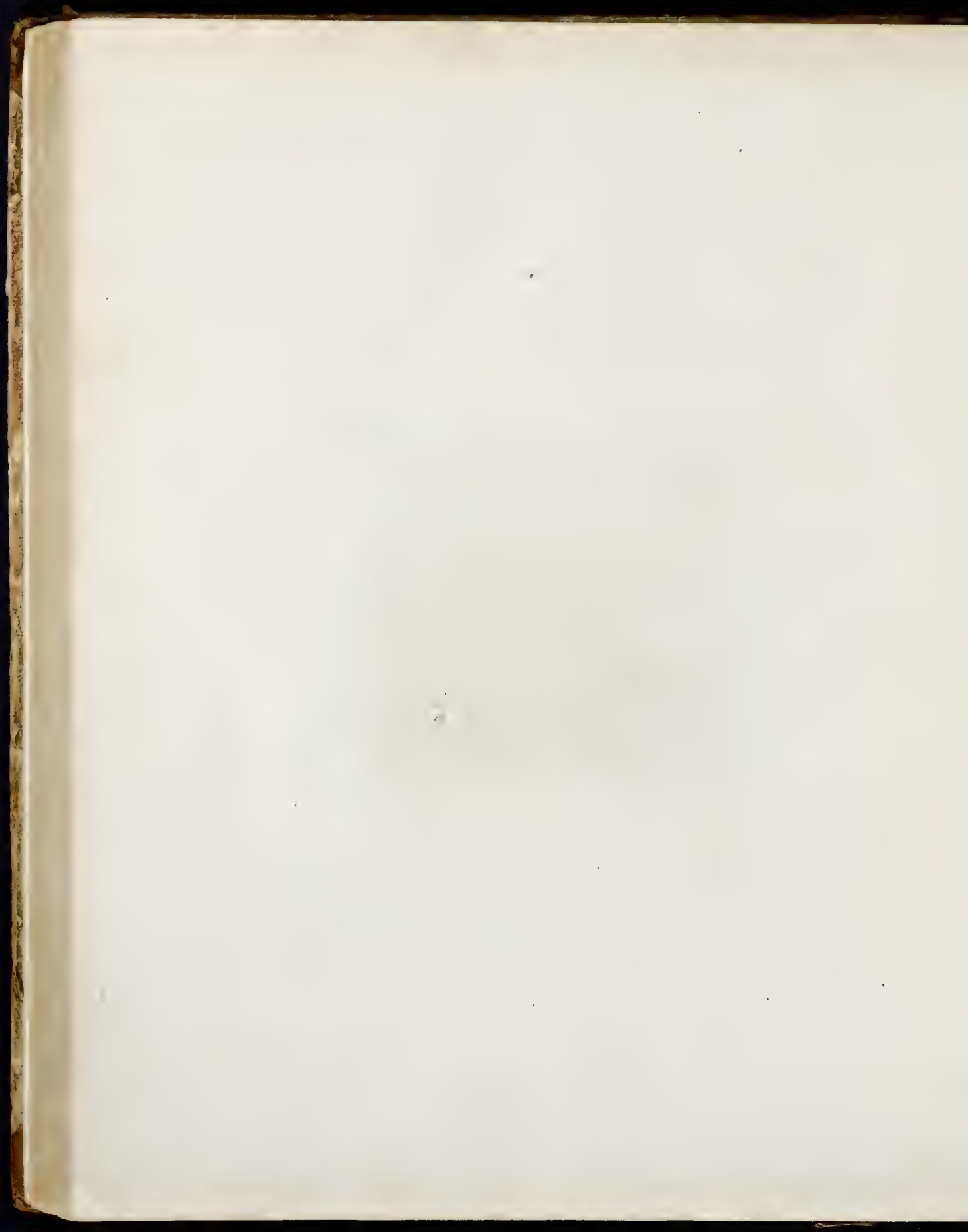
*J. Randers invet del.*

*T. Miller sculp.*

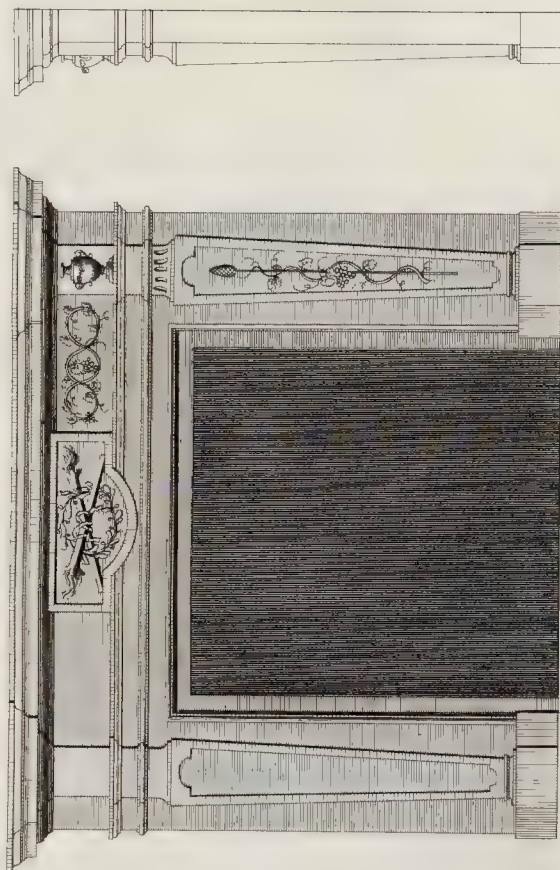








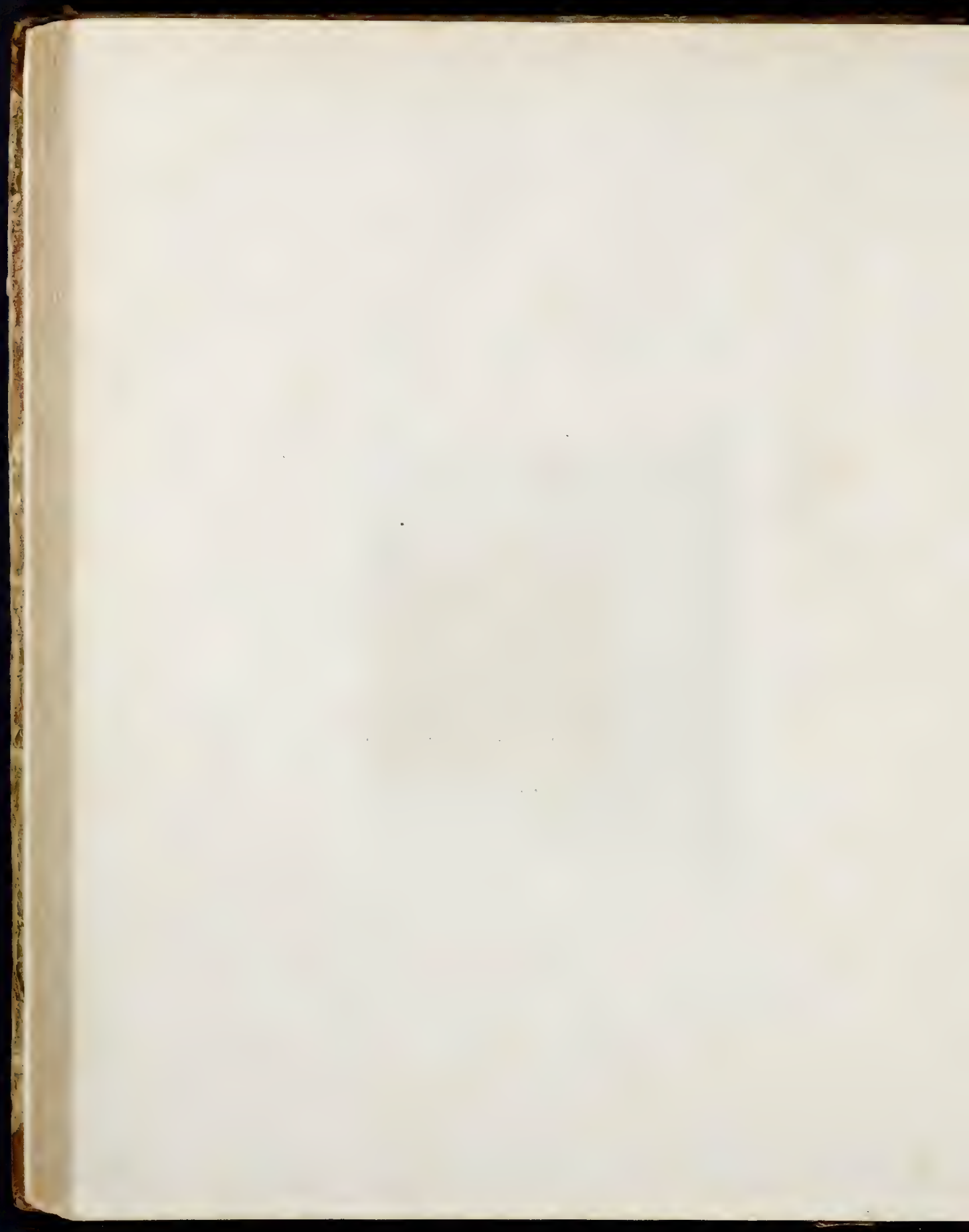
Pl. L.I.

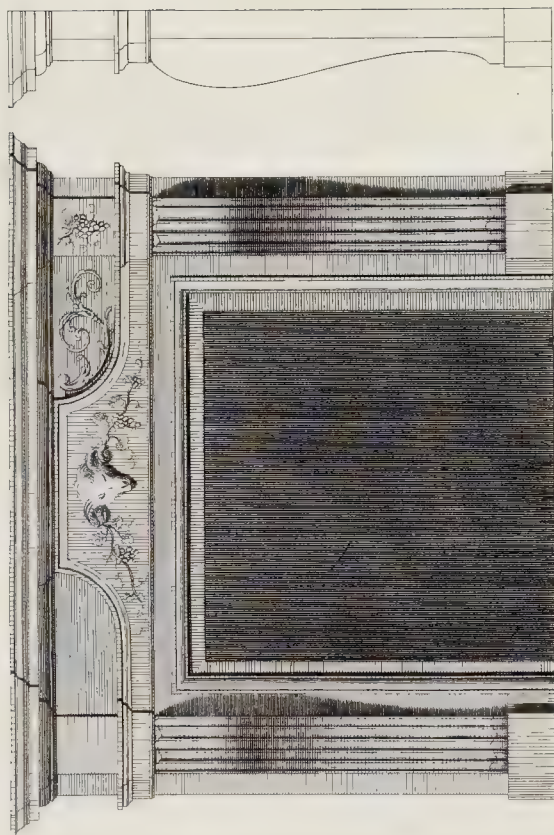


*di Benedetto*

*di Milano*



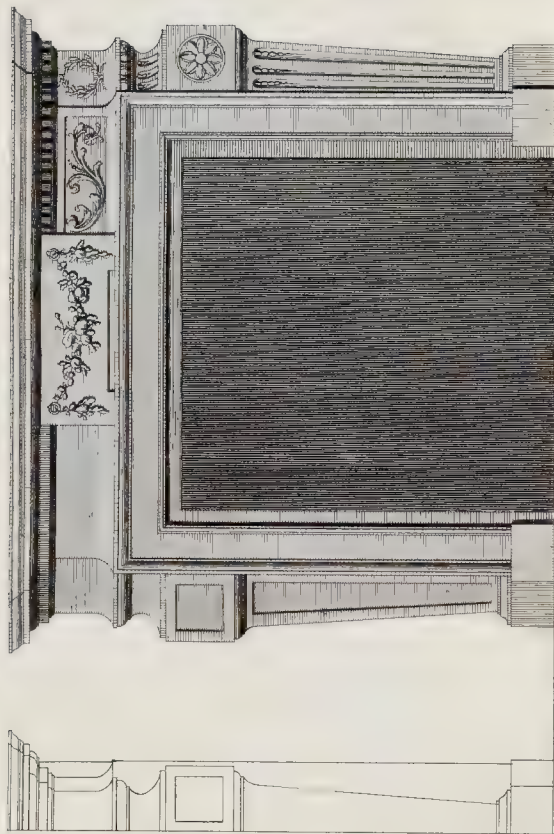




et. Roubin sculp.

et. Miller sculp.

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OF THE  
MUSEUM  
OF  
COMPARATIVE ZOOLOGY  
AND  
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COMPARATIVE ZOOLOGY  
AND  
ANATOMY

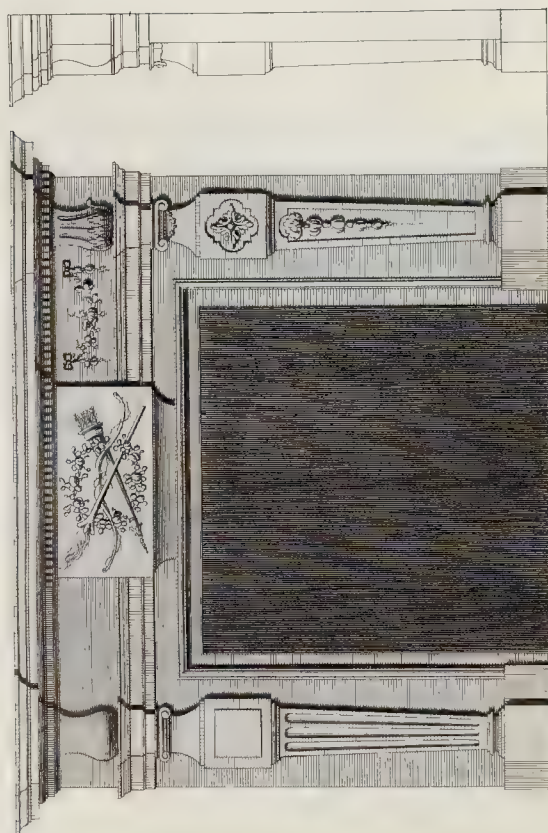


J. Richardson del.

J. Miller sculp.

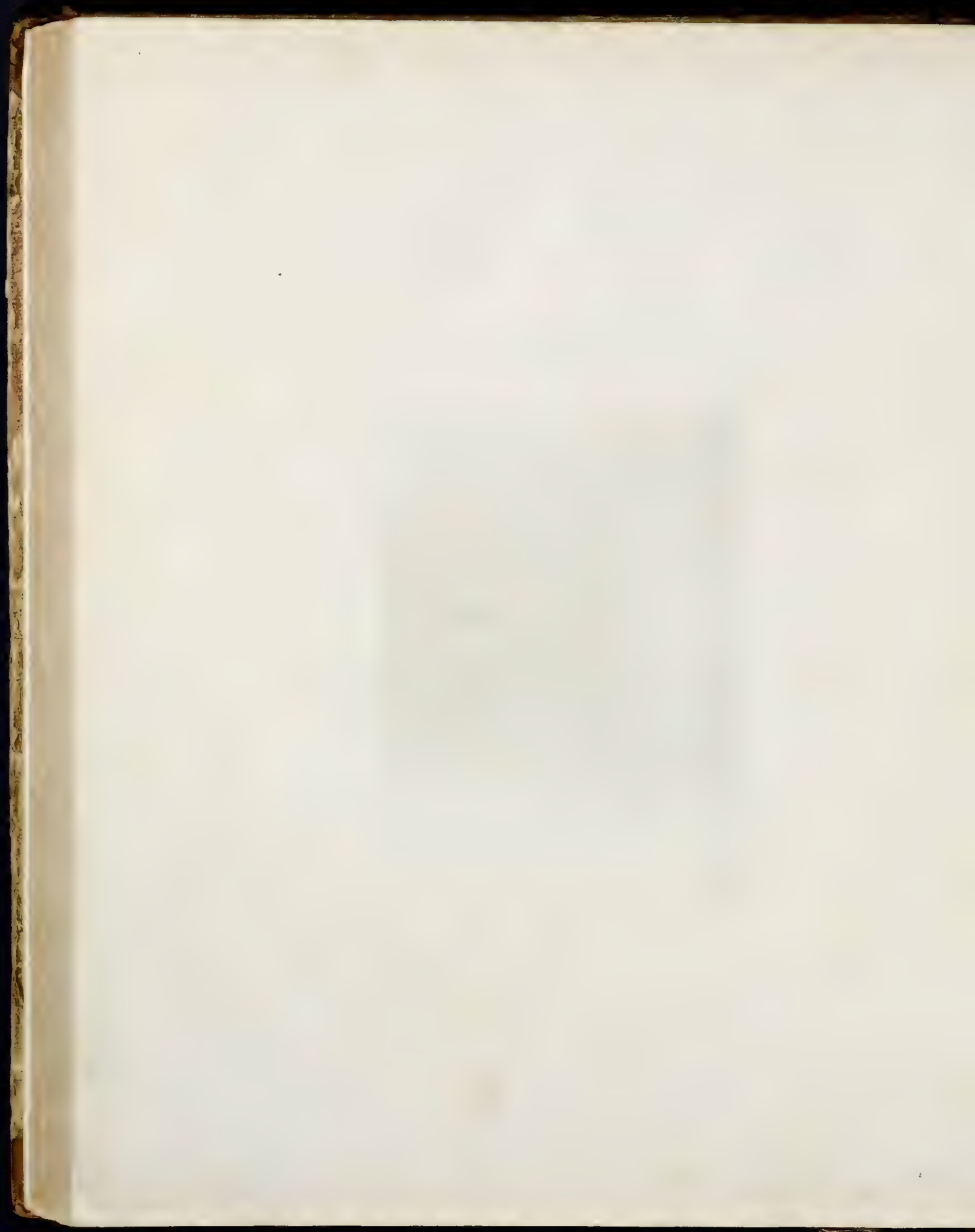


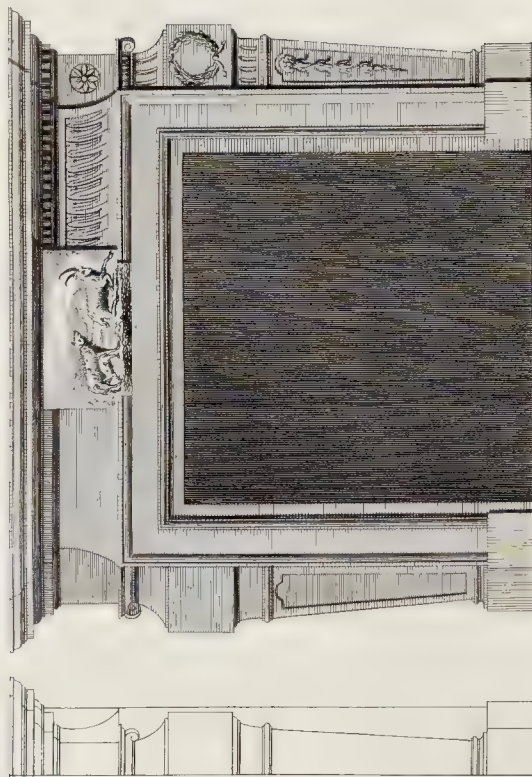




*et. M. B. 18. 18. 18.*

*et. M. B. 18. 18. 18.*

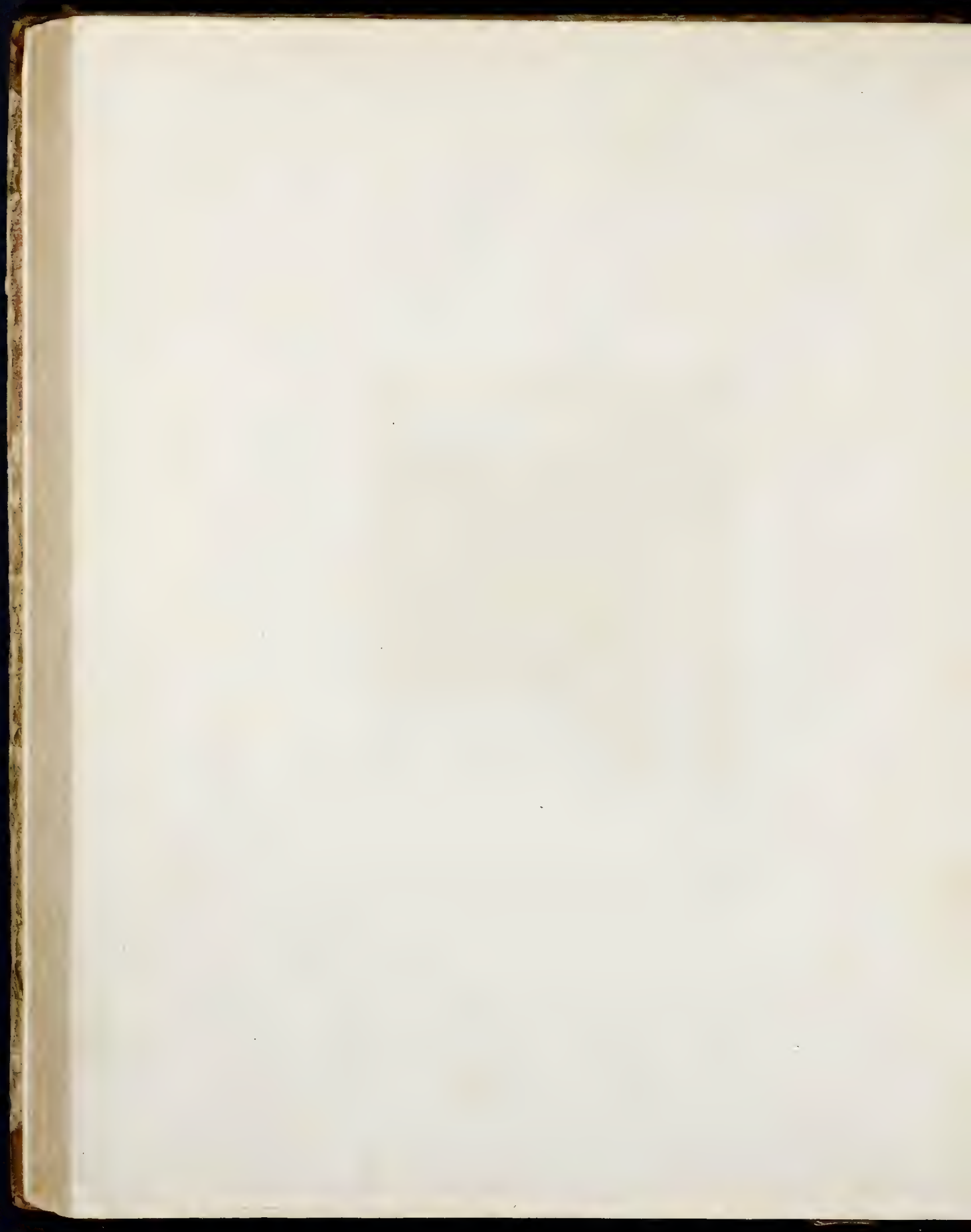


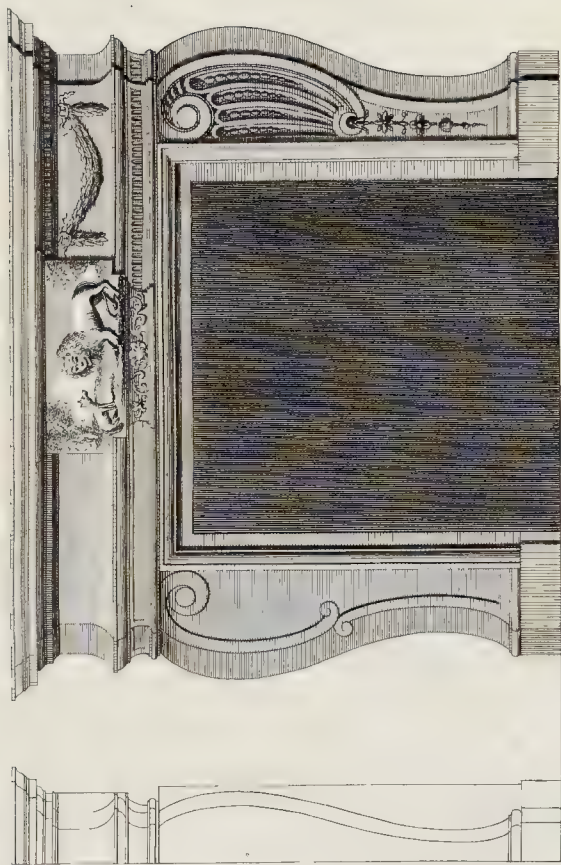


*St. Basilica in Constantinople.*

*St. Peter's in Rome.*



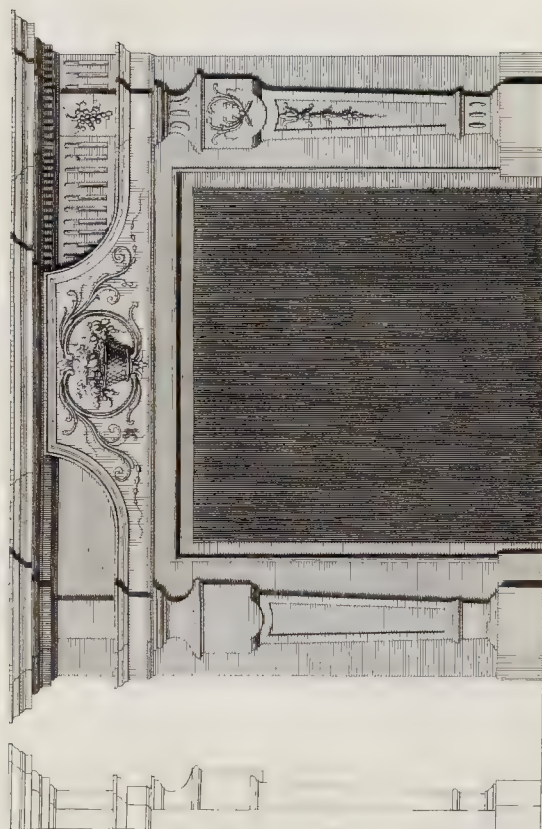




*G. Miller sculp.*

*J. Bouchier sculp.*

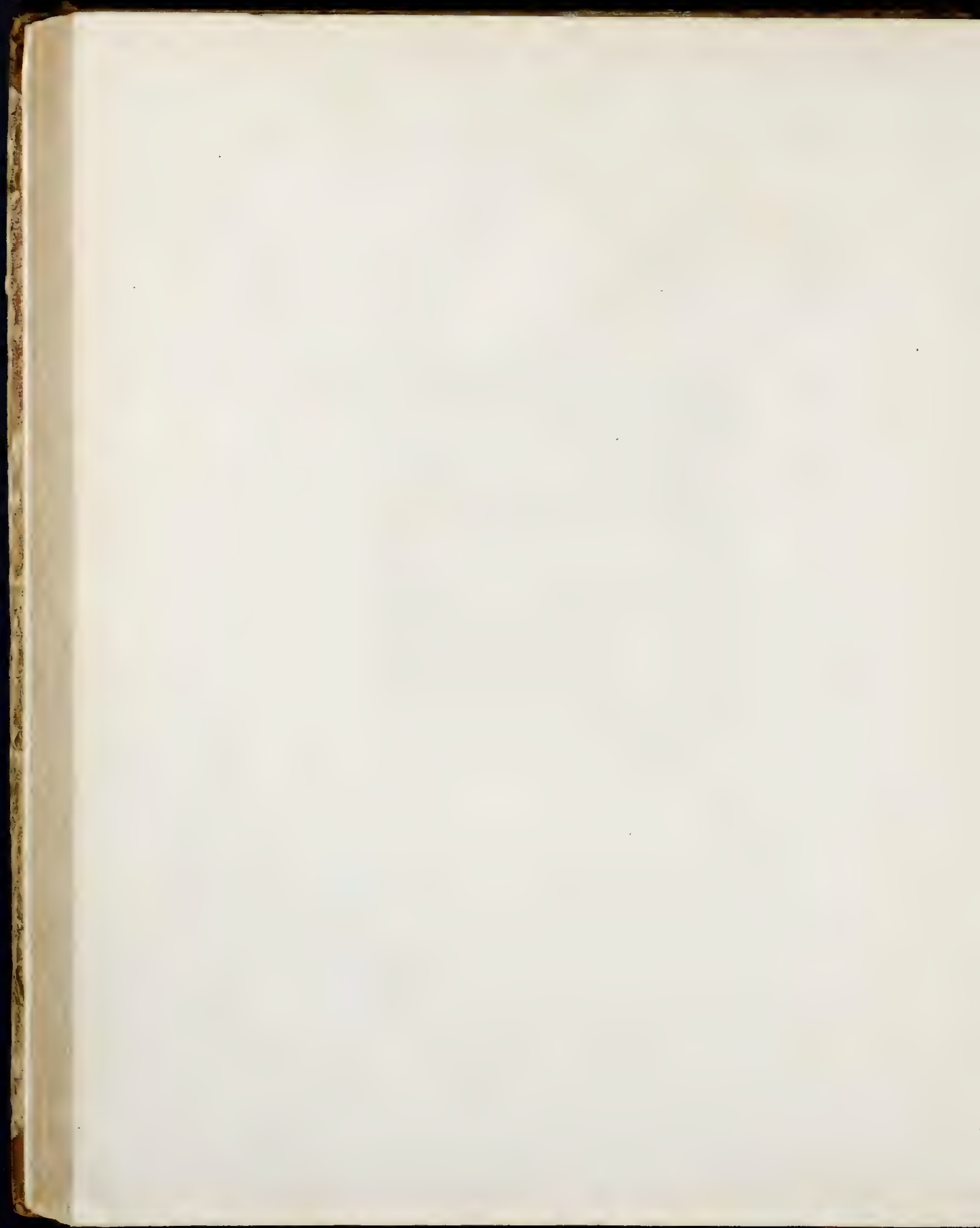




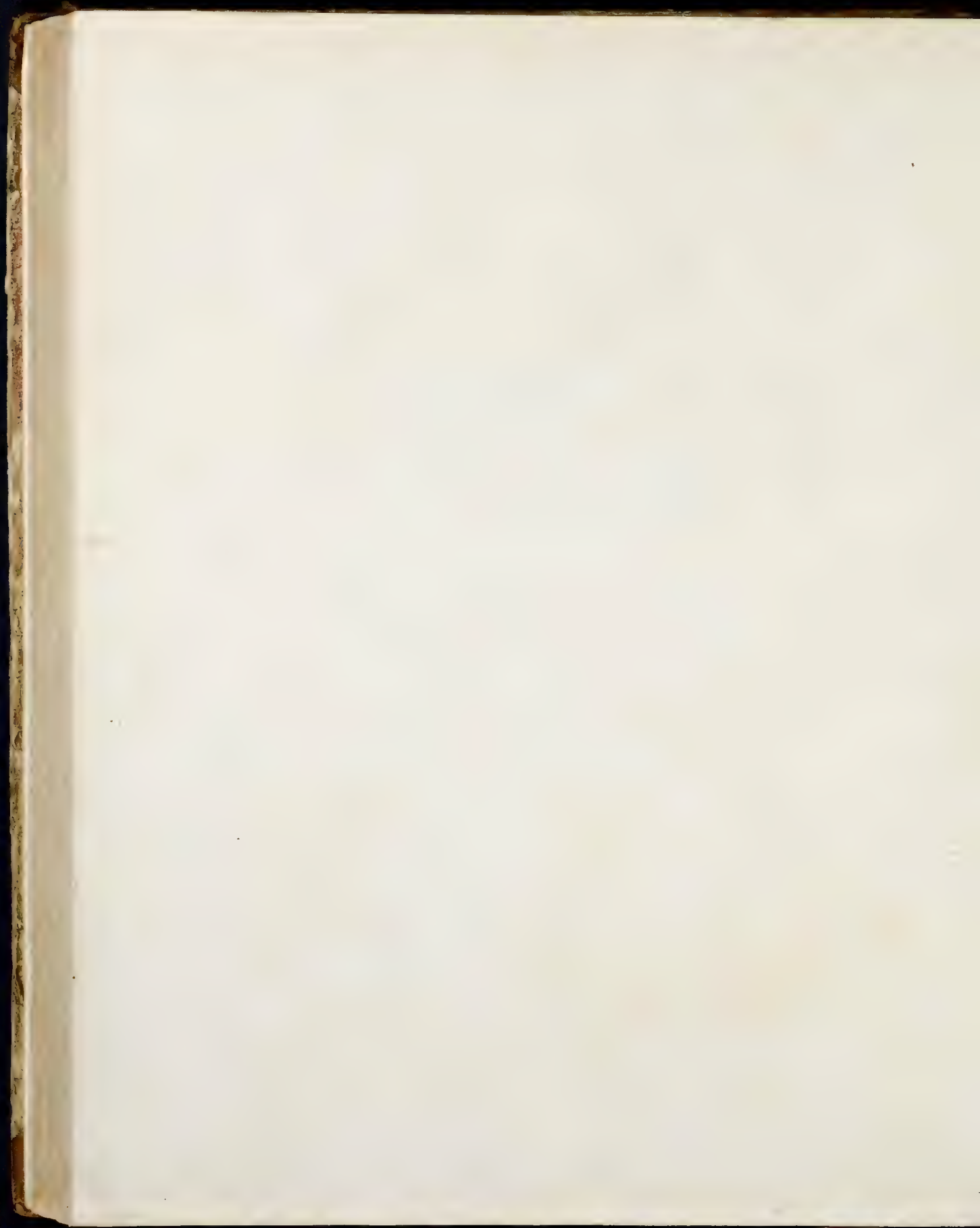
et Prædicta in et del.

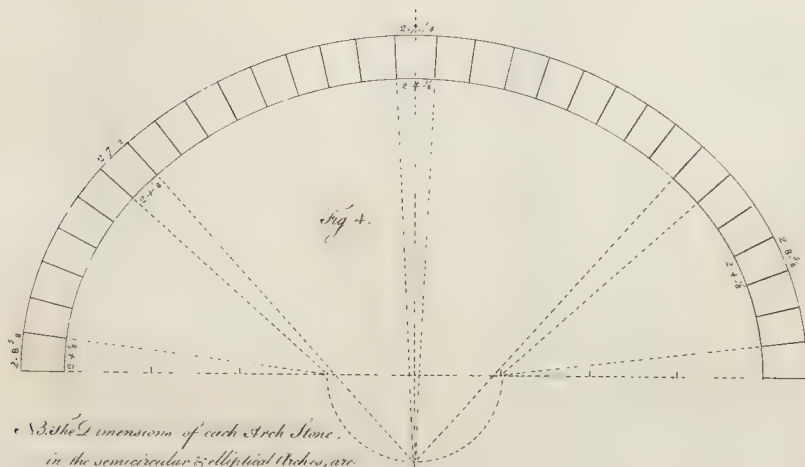
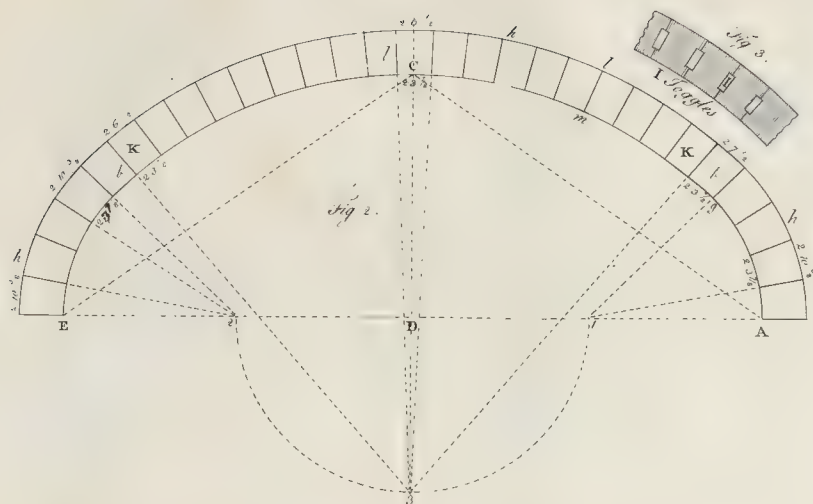
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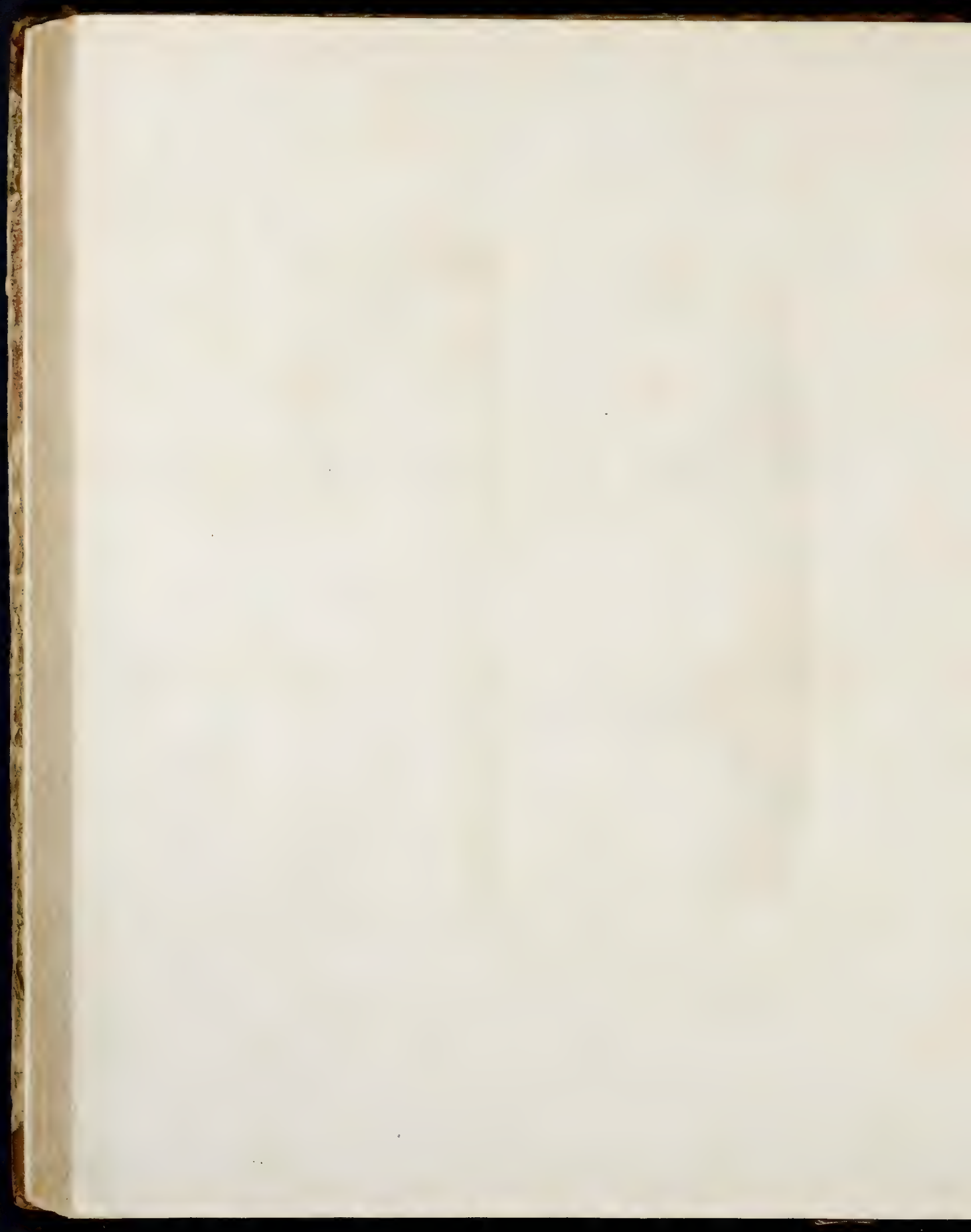


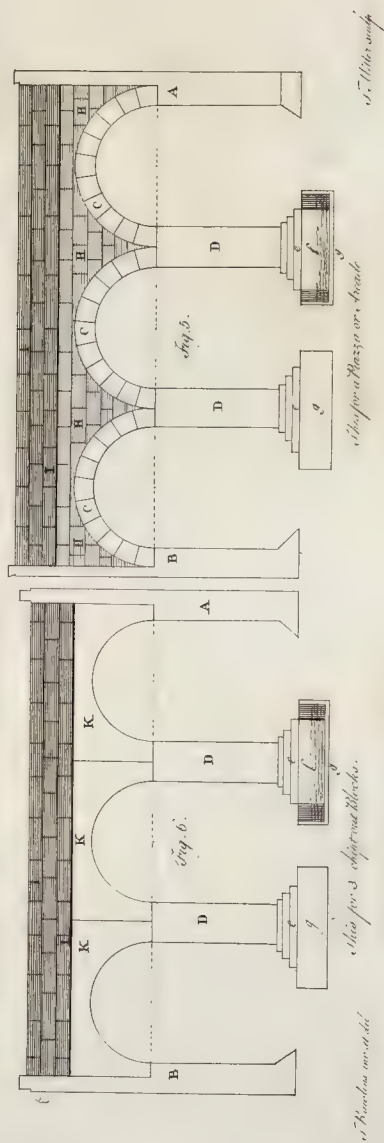
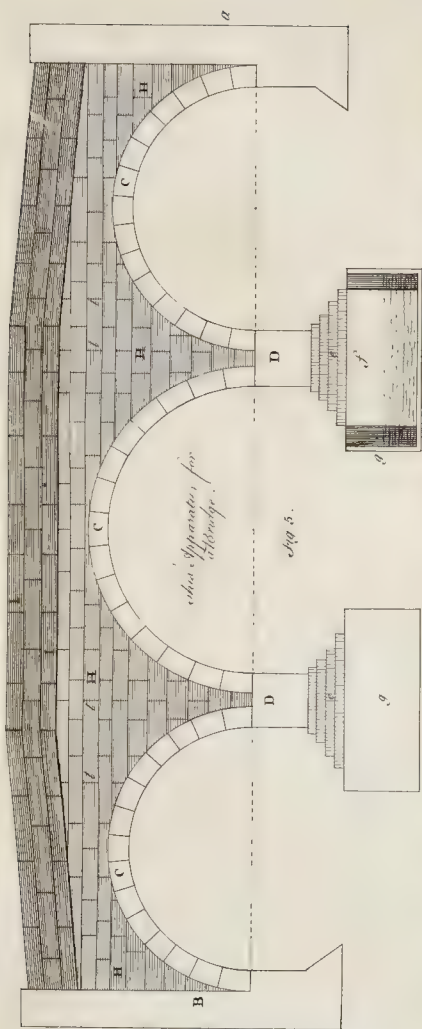


• Both the dimensions of each Arch Stone,  
in the semicircular & elliptical Arches, are  
taken from a draw<sup>d</sup> made by a scale of 1" = 20' or 30'.  
as Rector, and did

J. Miller sculp.





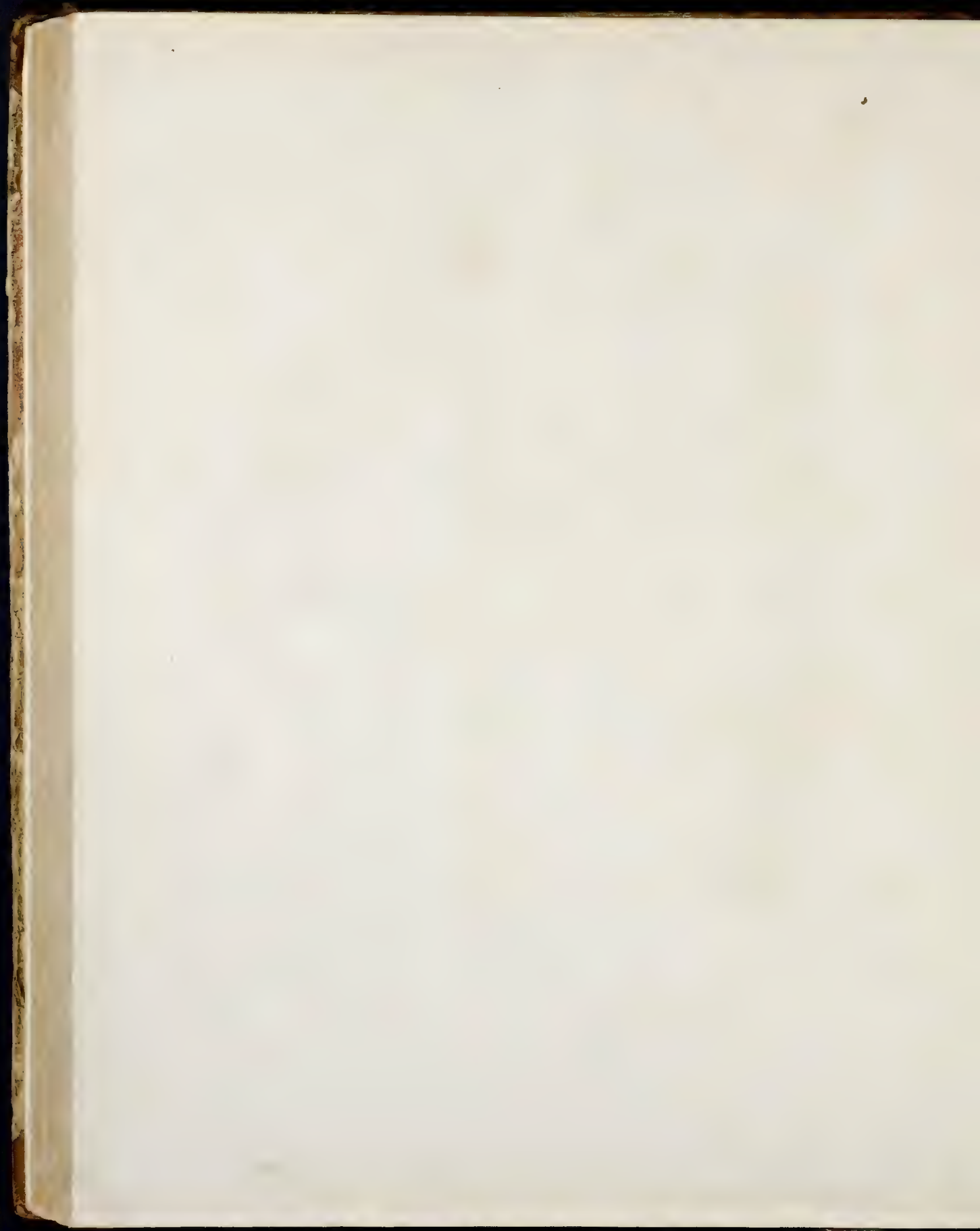


chambre d'appartement pour le Roi

chambre d'appartement pour le Roi

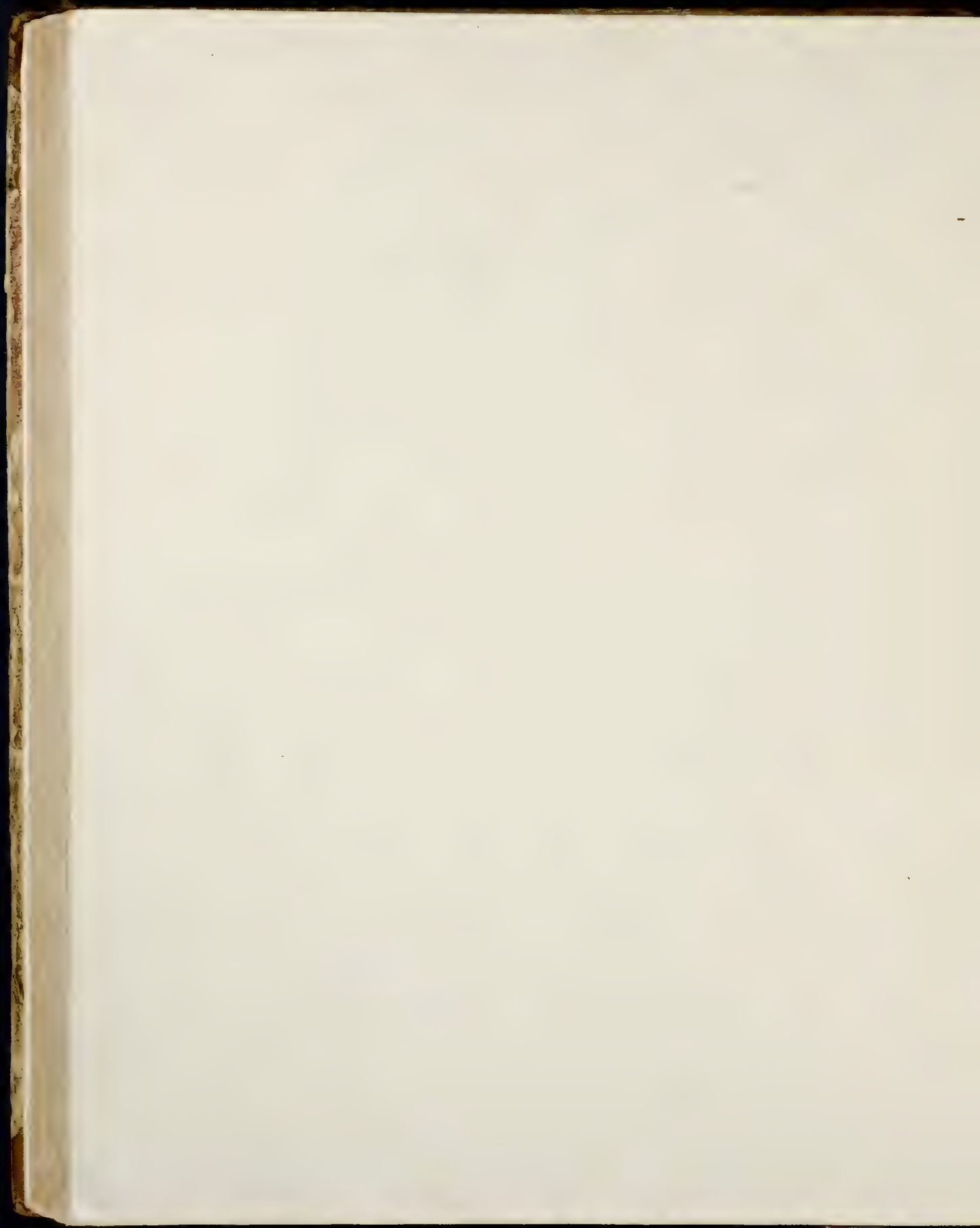
chambre d'appartement pour le Roi

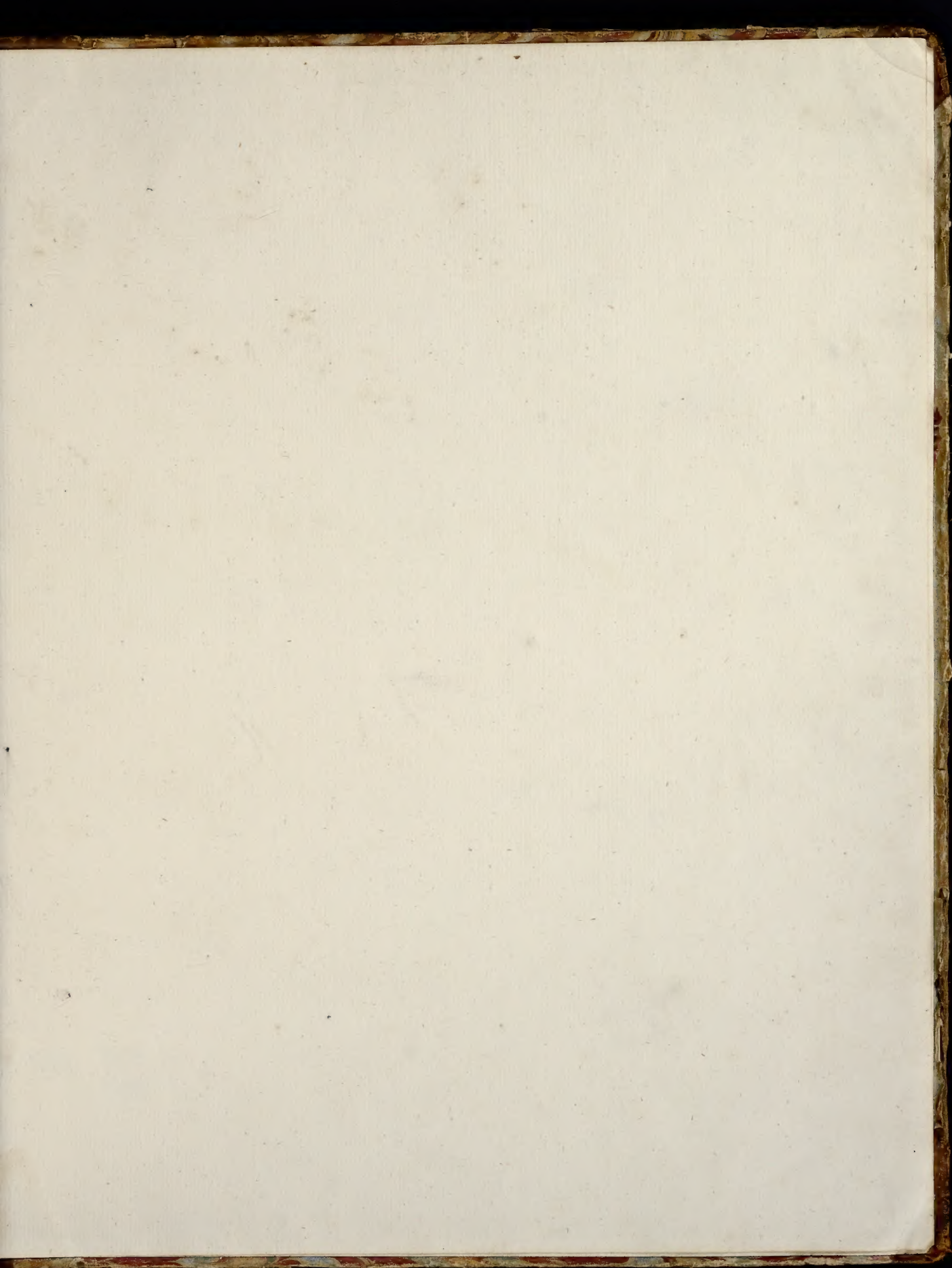
chambre d'appartement pour le Roi















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